

A black and white portrait of Dr. Fred C. Bersworth, a middle-aged man with glasses, wearing a suit and tie. He is looking slightly to the right of the camera with a gentle smile. The background is dark and out of focus.

MARCH 1955

# chemical processing

For Men Who Manage

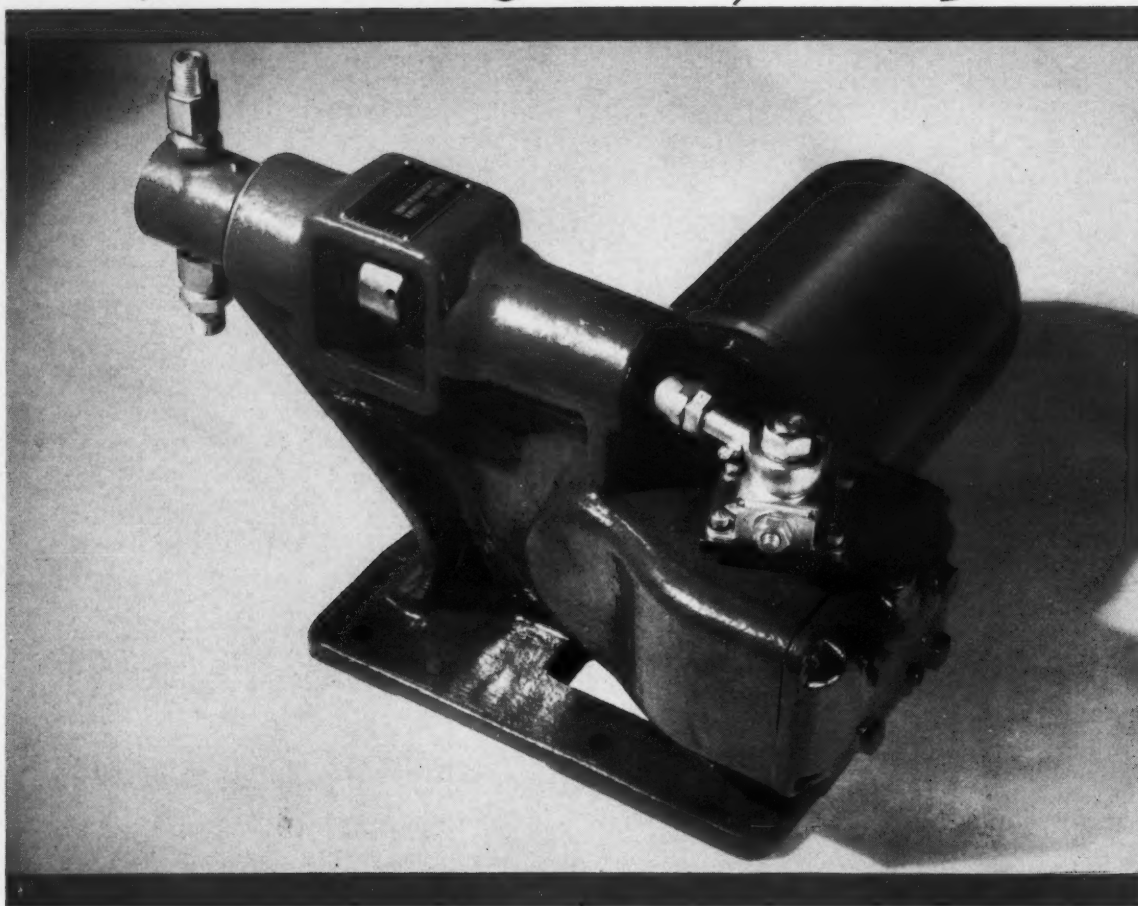
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Dr. Fred C. Bersworth  
Pioneer of Progress  
in Chelation Chemistry  
... see page 10


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### Spinach becomes weapon in war on smog

A number of plants, spinach among them, have been found to show a distinctive damage pattern when exposed to smog. Studies of this damage are yielding helpful information to the smog control program in Los Angeles.

### Air battles simulated by electronic brain

British scientists have developed an electronic brain as big as six houses for use in simulating aerial battles on a 3-D screen. The giant "tridac" (three dimensional analogue computer) will also help solve guided missile problems too complicated for man.

For more information on product at left, specify CP 5486 . . . see information request blank opposite last page.

# chemical processing

(CHEMICAL PROCESSING PREVIEW)

*for men who manage*

Vol. 18

March, 1955

No. 3

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MARCH, 1955



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W-11

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**Over  
the editor's  
shoulder**

**Only the beginning**

Although we enjoyed our trip to Atlantic City last year, we're glad the Packaging Show is in our hometown next month. As with other shows, it gives us another opportunity to greet old friends and make new ones . . . all as part of the process of gathering packaging ideas to pass along to you. Judging by last year's Show, which was a great success, this year should again turn up excellent material for CHEMICAL PROCESSING's readers.

Along with the unexpected, we'll be looking for: increased use of polyethylene and other plastics and films; more liquids and semi-liquids packaged in specially-lined fiber drums; filling machines with increased speeds that are able to handle those "problem materials"; larger containers for bulk shipment of powders and pellets; faster methods of labeling or otherwise identifying products.

Of course, contacts at the Show will send us off to many of the 48 states to gather stories on how this or that packaging idea is working out "in the field." All these reports will come to you throughout the year in CHEMICAL PROCESSING.

At the Show or on the road, however, gathering material for stories is only the beginning. That material must be "processed" so that when it is finally "packaged" each month it is as factual and brief as we can make it for the busy reader. Ideas are important . . . they demand care in preparation, useful and attractive presentation . . . just as your products.

*Roy G. Helsing*

ASSISTANT EDITOR

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**THIS  
MONTH'S  
COVER**

Fred C. Bersworth, pictured on the cover of CHEMICAL PROCESSING this month did most of the initial work of developing chelation chemistry. Sharing the spotlight with him is Frank Kottek, and the rest of the Versenes, Inc., team which has made "chemical magic" possible. Story of the inception and growth of Versenes starts on page 10.



(Association and Society addresses appear on page 200)

*March 7-11.* National Association of Corrosion Engineers, 11th Annual Conference and Exhibition, Palmer House, Chicago, Illinois.

*March 15-17.* American Institute of Electrical Engineers, Conference on Electrical Utilization of Aluminum, Pittsburgh, Pa.

*March 20-23.* American Institute of Chemical Engineers, Kentucky Hotel, Louisville, Ky.

*March 29-April 7.* American Chemical Society, 127th meeting, Cincinnati, Ohio.

*March 30-April 1.* 17th Annual American Power Conference, Hotel Sherman, Chicago, Illinois.

*April 6-10.* World Plastics Fair and Trade Exposition, National Guard Armory, Los Angeles, Calif.

*April 13-15.* Conference on Biological Waste Treatment, Manhattan College, New York City.

*April 17-20.* American Oil Chemists' Society, 46th Annual Meeting, Roosevelt Hotel, New Orleans, Louisiana.

*April 18-21.* American Management Association, 24th National Packaging Conference and Exposition, International Amphitheatre, Chicago, Illinois.

*May 1-4.* American Institute of Chemical Engineers, Shamrock Hotel, Houston, Texas.

*May 16-20.* National Materials Handling Exposition, International Amphitheatre, Chicago, Illinois

*May 18-19.* Chemical Market Research Association, Annual Meeting, Plaza Hotel, New York City.

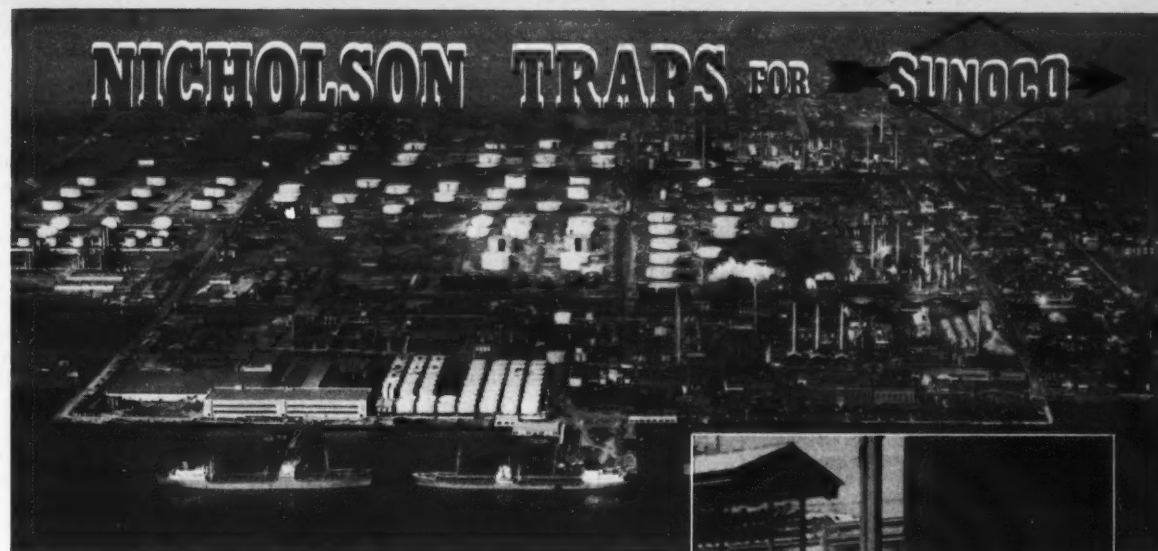
*May 22-26.* Air Pollution Control Association, Annual Meeting, Detroit, Michigan.

*May 23-27.* American Society for Testing Materials, Third Annual Conference on Mass Spectrometry, Mark Hopkins Hotel, San Francisco, California.

*May 31-June 3.* First Design Engineering Show (formerly Basic Materials Exposition), Convention Hall, Philadelphia, Pennsylvania.

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- The product directory, pages 201 to 204, is your guide to all articles and advertisements
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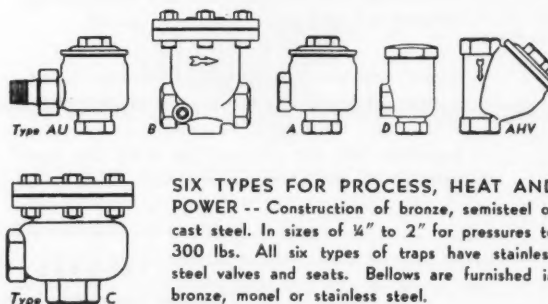


Air view of Sun Oil Company's refinery at Marcus Hook, Penna.

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Nicholson steam traps are shown above installed on storage tanks requiring heating at Sun Oil Company's Marcus Hook, Pa., refinery. Sun has standardized on this type of installation.

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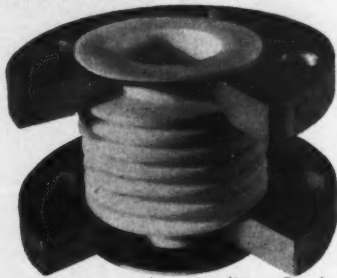
# DORE'

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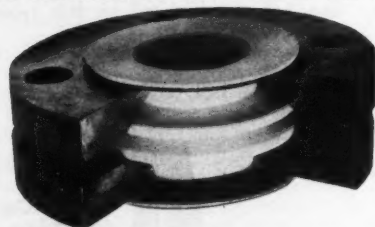
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Inert to a wide range of commodities, Dore's Style E-8 TEFLON Bellows are recommended for maximum working pressures of 50 p.s.i. and temperatures of 150° F. They absorb shock, vibration and movement caused by thermal expansion and contraction in piping systems. Style E-8 TEFLON Bellows are furnished with integrally gasketed standard 125-lb. steel flanges. They are available with diameters 1" through 20", in lengths from 1½" to 60".

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Dore's TEFLON Flexible Couplings are made with only two convolutions and will operate successfully where there is a minimum of vibration or mis-alignment. Style E-8-S Flexible Couplings are ideal where there is only a small amount of movement or mis-alignment. They are an easy to install, economical, inert coupling for these services.

**MAXIMUM WORKING PRESSURE 50 P.S.I.**  
**MAXIMUM WORKING TEMPERATURE 150° F.**  
They are available with diameters 1" through 20", in lengths from 1½" to 2½".

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**DONALD G. WARD**  
Director of Transportation  
Olin Mathieson Chemical Corp.

*A graduate of the University of Southern California, Mr. Ward has been employed by the Santa Fe, Union Pacific, and Southern Pacific railroads. He joined Shell Chemical Corp. and Shell Oil Company in 1929, working in their Traffic Departments in Los Angeles, San Francisco, and New York City. In March 1950, Mr. Ward joined the former Mathieson Chemical Corp. (now part of Olin Mathieson Chemical Corp.) as General Traffic Manager. He was appointed Director of Transportation in Jan. 1951.*

*Mr. Ward is Vice President of the National Industrial Traffic League, a member of the Board of Directors and User Panel of the Transportation Association of America. He is also Chairman of the Legislative Subcommittee of the Manufacturing Chemists' Association, Chairman of the National Transportation Policy Subcommittee of the T & C Committee of the US Chamber of Commerce, and Chairman of the Nat'l Conf. for Repeal of Taxes on Transportation.*



## transportation and the chemical industry

*The rapid expansion of the chemical industry is, perhaps, best exemplified by new plants, new locations. Some of these plants are doomed to suffer unnecessary losses, or even failure, because certain vital long-term factors regarding transportation were not adequately considered. Here are some guides to work by and some pitfalls to avoid.*

There are several aspects of transportation economics of vital interest to the chemical industry which are frequently, in whole or in part, mishandled. We are all familiar with the rapid expansion of the chemical industry. This expansion

has resulted in the construction of many new plants. Some of these plants have been strategically located so that their long-term future seems assured. In other cases, however, plants have been located to meet today's conditions, but it is extremely doubtful that they will meet the long-term requirements of the future.

Before a new plant or warehouse can reach the blueprint stage, a strategic site must be chosen. In choosing this site, there are many factors to be considered, all of which are important. However, in the long-term, over-all view, transportation and related functions may well be controlling. An example or two will serve to emphasize

### TRANSPORTATION CHECK-LIST

**You may lose money in the long run, unless you get full details on these points before deciding where to build a new plant**

|  |  |
|--|--|
| Railroad service (passenger and freight)                 | Attitude of carriers                         |
| Motor truck service                                      | Side track facilities                        |
| Railroad switching facilities                            | Cost of extra trackage                       |
| Water transportation                                     | Highway conditions                           |
| (barge and ocean service)                                | Distance from home office                    |
| Air service (freight and passenger)                      | Laws affecting transportation                |
| Express service  | Direct and access streets                    |
| Port facilities  | Nearness to trunk highways                   |
| Pipelines  | Nearness to trunk rail lines                 |
| Freight rate structures                                  | Possible interruptions in transport services |
| Transportation from homes to work, including bus service | Transportation congestion                    |

When inquiring check CP 5489 opposite last page

the pitfalls inherent in situations where transportation is not thoroughly analyzed in over-all planning prior to the selection of an industrial site.

Recently, a large industry located a plant about seven miles from the nearest railroad. This seemed logical since the bulk of outbound finished products would move by tank truck. However, the location was a mistake. In this instance, a suitable property could have been purchased adjacent to railroad lines where rail service could be supplied at not too great an expense. Moreover, the cost of construction of this plant was unnecessarily increased by the necessity of transferring all heavy equipment from rail sidings to the plant site by truck. In addition, in the event of a truck strike in the area, the plant would be out of business, as rail service would not be available.

This plant may also be severely handicapped in the future, as there is no long-term assurance that both rail and truck rates on outbound finished products will remain equalized. At the same time, future expansion of the plant may well be limited if it is desired to manufacture new products requiring rail transportation in lieu of truck transportation.

Here is a further instance of insufficient consideration being given to transportation conditions involving the location of plant sites. A few years ago, a plant site was chosen adjacent to water and rail transportation. Unfortunately, however, the firm which made the transportation survey overlooked two very vital transportation factors. Consideration was not given the fact that the destination markets were located in a different freight rate jurisdiction from the one applying at the location of the plant. This increased transportation costs on finished products some three million dollars more than originally estimated and resulted in freight rates considerably higher than those applying for competitive plants located in the destination freight rate territory.

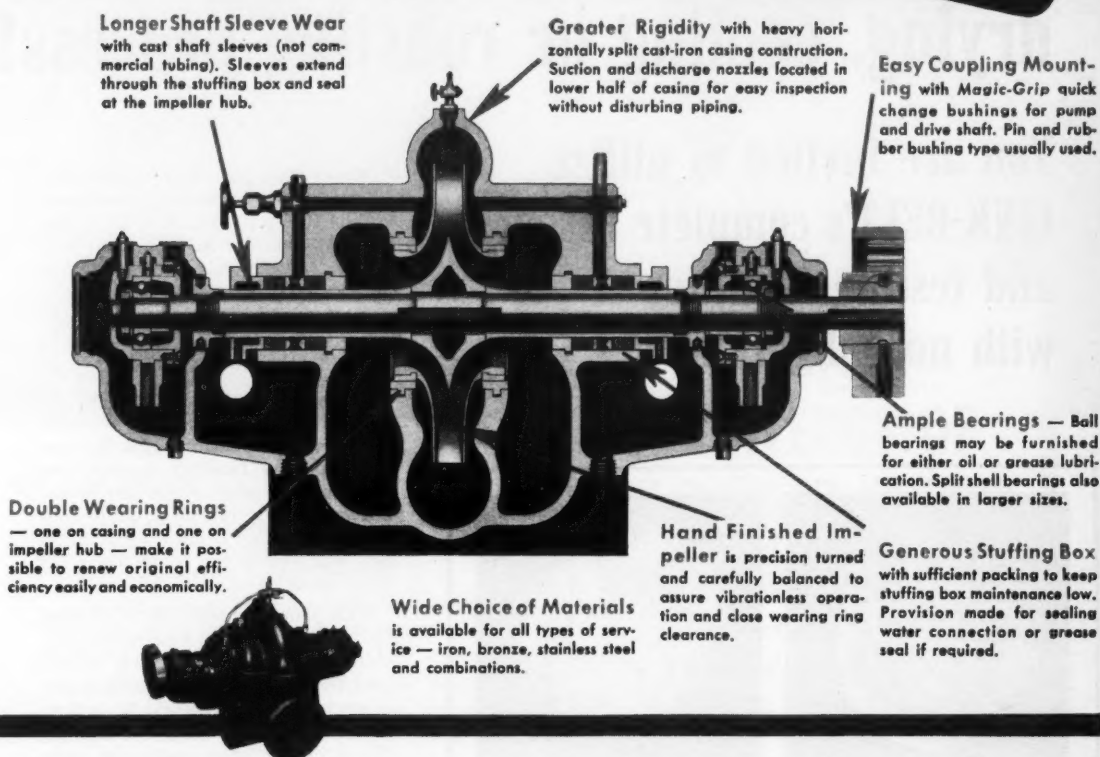
Through some rather extraordinary handling on the part of the traffic department of this industry, approximately a million and a half dollars of this freight loss was eliminated. However, based on present freight rate structures, approximately one million dollars will be lost to this company during the life of this plant.

The second error was that while this plant was admirably located from the standpoint of transportation as a whole, consideration was not given the fact that, in order to serve the plant, a railroad branch line had to be constructed for a distance of some two miles. This would normally cost anywhere from twenty to thirty thousand dollars but, because of unusual conditions in this instance, the cost was in excess of five-hundred thousand dollars. These errors could have been avoided by a thorough and complete analysis of

(Continued on page 197)

# Get 8 Advantages of GOOD PUMP DESIGN

ALLIS-CHALMERS  
Double-Suction  
PUMPS



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with cast shaft sleeves (not commercial tubing). Sleeves extend through the stuffing box and seal at the impeller hub.

**Greater Rigidity** with heavy horizontally split cast-iron casing construction. Suction and discharge nozzles located in lower half of casing for easy inspection without disturbing piping.

**Easy Coupling Mounting** with Magic-Grip quick change bushings for pump and drive shaft. Pin and rubber bushing type usually used.

**Double Wearing Rings** — one on casing and one on impeller hub — make it possible to renew original efficiency easily and economically.

**Ample Bearings** — Ball bearings may be furnished for either oil or grease lubrication. Split shell bearings also available in larger sizes.

**Hand Finished Impeller** is precision turned and carefully balanced to assure vibrationless operation and close wearing ring clearance.

**Generous Stuffing Box** with sufficient packing to keep stuffing box maintenance low. Provision made for sealing water connection or grease seal if required.

**Wide Choice of Materials** is available for all types of service — iron, bronze, stainless steel and combinations.

**HEAVY DUTY CONSTRUCTION** with no skimping, no corner cutting is what you'll find in Allis-Chalmers double-suction pumps. Extra metal thicknesses, extra strong parts, extra features and extra careful workmanship add up to long life, low maintenance, and low cost per gallon pumped.

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## Complete Pumping Unit

Allis-Chalmers can furnish the complete installation — pump, motor, control and drive — all built of coordinated design and manufacture.

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A-4590

# ALLIS-CHALMERS



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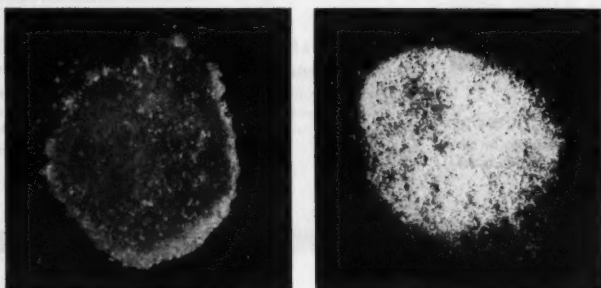
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### Here's how it works . . .

Simply arrange to ship a sample of your material to Link-Belt. Whether it's a pound or a carload, Link-Belt has the laboratory facilities to work out procedures *in advance* that can be duplicated in your own plant. Or, if shipping the material is not feasible, Link-Belt will furnish you equipment for a pilot operation right at the site.

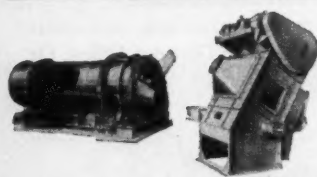
This plan has been utilized by hundreds of processors. It's the no-risk, no-obligation program that has helped Link-Belt place more than 600 dryers in service all over the world. More than 100 different materials are now profitably dried, cooled or roasted by Link-Belt equipment.

If you're planning a change in your processing, *don't gamble!* Ask your Link-Belt representative for full information on this proved service. And be sure he gives you informative literature on the wide range of Link-Belt processing and materials handling equipment.

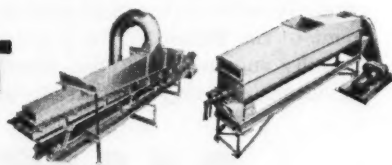


### From filter cake to crystals . . .

To produce a sparkling, discreet particle, this wet filter cake has been processed by a Link-Belt Roto-Louvre Dryer, cutting water content from 5% to 0.5%. The Link-Belt laboratories can show you how you can economically change the size, shape or consistency of materials . . . blend, compound or convert them to desired chemical composition.



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*what you can expect in next month's issue . . .*

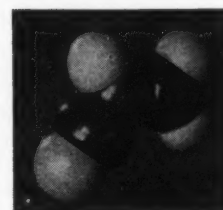
### Survey of Chemical Materials

A thorough survey of chemical materials introduced in 1954, with a convenient index of their uses, will highlight **CHEMICAL PROCESSING's** featured section on Materials next month. The editors, hoping to fill a need for an easy-to-use, brief, but complete compilation of the countless new materials now available, have been in contact with the entire industry for this up-to-date information.

The "use-index", presenting the imposing list of chemicals according to their uses, will quickly pinpoint the materials you need for specific purposes . . . and a list of manufacturers will tell you where to write for full details about any product.

In other parts of the featured section, the amazing complexity — and variety — of acrylonitrile derivatives and uses (see molecular model, right) will be described . . . and reference nomographs will summarize vapor pressure data for hydrocarbons, and simplify calculations for manufacture of alkyd resins.

"Guest" editorials written by authorities in the industry, plus our regular coverage of materials developments round out this comprehensive presentation you won't want to miss.



### Compact centrifugal extractor eliminates bulky equipment

A "New Solutions" highlight for April tells how Shell Chemical Company solved the problem of high-cost liquid-liquid extraction in its monomer-polymer separation process at Houston. A compact centrifugal extractor (pictured here) measures only 4 x 5 x 5', handles 950 gph, replaces a considerable amount of bulky equipment.



The unit has done much to simplify Shell's monomer-polymer process, and has eliminated all of the previous trouble spots. Flow diagrams and photos supplement the complete story, only one of many in installation accounts of new solutions to plant problems appearing next month.

Here's a quick preview  
of features you'll find  
in April Chemical Processing

Three men lay  
plastic pipe —  
rate: 4000 ft/day



Light plastic pipe, easy to join and lay, requires the services of only three men, who can do the job at the rapid rate of 4000 feet — almost a mile — a day. The pipe is used to carry corrosive waste salt water from several Mississippi oil wells to a disposal point 12 miles away.

Details of this easy-to-handle pipe and many other stories on corrosion control are presented.

#### Automatic system assures safety at Goodyear

Always an important consideration in successful plant operation, safety problems and solutions are covered in every issue of CHEMICAL PROCESSING. Highlighting April's Safety section is an installation account of the safety setup at Goodyear Tire & Rubber Co's synthetic rubber plant at Akron. Fully automatic system includes continuous gas detectors, fire-fog sprinklers and other features. Details are presented by Goodyear Fire Chief J. L. Shifflett and Assistant Editor Richard J. Callahan.

#### GE bombards PE, tells story

Polyethylene, daily finding new industrial and commercial uses, is getting extra treatment at the Chemical Division of General Electric Company in Pittsfield, Mass. The material is being bombarded with high-energy rays, improving its resistance to heat, chemicals, and stress-cracking.

GE's work is told in the Ideas section feature.

#### And in Brief . . .

Single-pass, turbulent-film evaporator concentrates heat-sensitive pharmaceuticals at Hoffman-LaRoche, Inc., saves time and space, and improves product. Story is "New Solutions" feature for April . . .  
. . . and many other up-to-date, informative articles appear in every section of CP, covering all fields of chemical processing industries.

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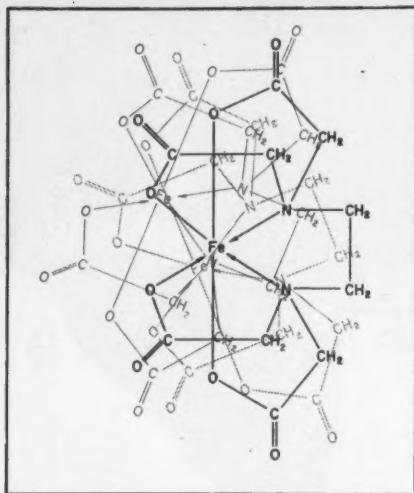
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Catalog Sections  
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Catalog Section  
S-7480

When inquiring check CP 5492 opposite last page



Once in a great while a chemical discovery comes along which is so shattering to our accepted theory that it is labeled "impossible." Fred Bersworth, Frank Kottek, and other men of Versenes, Incorporated have worked with such a discovery. They now stand the winners in a long battle to convince technical people that they are not dealing in magic or impossibilities, but in . . .



FRANK KOTTEK



FRED BERSWORTH

## chelation | a new kind of chemistry

Imagine a single family of closely related chemicals capable of dramatically curing lead poisoning, keeping white soap white while it waits on the grocer's shelf, making sick citrus trees bear an abundance of fruit, cleaning up dangerous radioactive contamination . . . it seems to smack more of magic than chemistry. Yet the versatile Versene compounds are doing all of this and much more.

It wasn't many years ago that even chemistry professors who watched the crucial early experiments were unconvinced themselves. Today there is little doubt except among Johnnie-come-latelys. And these people will be convinced and perhaps become large scale users themselves.

Despite the many established uses for chelating (KEY-lay-ting) agents the field grows at a prodigious rate. More potential uses are uncovered every month. Potential uses are converted to actual uses as production increases and costs drop.

Behind this growth are two stories — a technical one and a human one. Technically, chelation hinges on coordinate covalence — one of those phenomena that have been known in a vague sort of way for a

long time. Instead of forming ordinary molecules where one atom donates an electron to another, coordinate covalent molecules are formed when two atoms decide to *share* two of their electrons. This much was known before chelating agents made their debut.

*Kelos* is Greek for claw — a better descriptive term for chelation would be hard to find. A chelate compound is any compound which will inactivate a metallic ion with the formation of an inner ring structure in the molecule, the metal ion becoming a member of the ring. In the case of Versene compounds from three to five resonating rings are formed, indicating the Versene chelates are extremely stable and the original atom, now chelated, is effectively out of action until the chemist decides otherwise and breaks the grip of the claw.

Of course a simple explanation like this came only after years of work on the subject. When Fred Bersworth first "lost" a considerable amount of barium in a beaker of ethylene diamine tetraacetic acid sodium salts there was no such simple explanation handy. Dr. Benjamin Merigold of the staff of

Clark University (where it happened) just didn't believe it and sent Bersworth back to the lab to try the experiment again. Presumably if he worked carefully the bogey of a chemical impossibility would vanish — one more unnoticed mistake.

But vanish it profoundly did not and Mr. Bersworth and Dr. Merigold both found themselves working with a new kind of chemistry.

Bersworth had studied metallurgy, not chemistry, in Germany where he was educated. After returning to the US in 1916 he saw a future for chemicals in this country. It was during the late '20s that he went to Clark University to study. His role there was not that of the conventional student. He obtained permission to use the lab and library facilities and worked at projects that interested him. Dr. Merigold was impressed by his unconventional, but hard-working approach. He describes Bersworth as ". . . really a near-genius in originality of chemical investigation. He has a natural creative instinct."

It was in 1931 that Fred Bersworth and his brother-in-law, Frank Kottek, decided to launch a business based on these chemicals. While professors and chem-

ists were done, in factory town of Arnold the inf

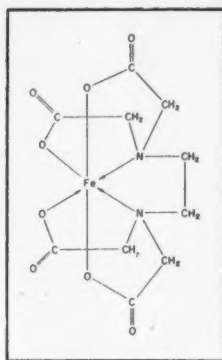
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Iron chelate ion

ists were still saying, "It's impossible, it can't be done, it doesn't make sense," Frank took over the factory of a defunct soap company in his hometown of Framingham, Mass. Another brother-in-law, Arnold Kottek, an engineer, completed the staff of the infant company.

The first project was to develop a process to make the raw material ethylene diamine in quantity at low cost. Then the most important product, Versene, could be made and sold at a reasonable price.

Bersworth, meanwhile, had moved to New Jersey to work for another chemical company. This trio carried on research by correspondence for a while. Fred wrote directions and Frank and Arnold tried them out. Despite a few "upsets" (Frank temporarily lost the sight of one eye) they made progress.

By 1932 they were selling ethylene diamine to German customers. Here was an unheard of thing. Germany, at the time, was the seat of supply for all organic chemicals. I. G. Farben made ethylene diamine — but not nearly so pure or of such consistent quality and charged nearly \$10 a pound. Even on shoestring capital, the venture was able to keep moving because of demand for this product.

Lab preparations of Versene compounds were used to introduce chelating agents to the trade and with a set of constant customers assured, the organization developed a process for making Versene compounds on a large-scale basis. This was rather simple when compared to the ethylene diamine synthesis.

#### Credulence: The Real Problem

But when they tried to branch out and do some of the things they knew these chemicals could do, potential customers were frankly unconvinced. The idea that rules of chemistry could be thrown to the winds was, if convenient, equally unbelievable. For the next several years the biggest problem was not

(Continued on page 198)

Atomic layers of metallic sodium can be coated on the surface of finely divided solids such as salt, soda ash, carbon, alumina, metal oxides and sand. The coated solids are free-flowing, can be used in fixed beds or fluidized systems, or can be suspended in hydrocarbons. The amount of sodium present depends on the particle size of the carrier, e.g., carbon black carries over 35%.

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When inquiring check CP 5493 opposite last page.

**J. A. POLLOCK**, Plant Manager  
The General Tire & Rubber Company,  
Ashtabula, Ohio  
with **GORDON WEYERMULLER**, Associate Editor

**Increased use as a protective coating  
illustrated at General Tire & Rubber's  
new plant where:**

## ***polyvinyl chloride tape prevents corrosion***

### **Plastic tape was used in three distinct applications**

- 1** As insulator between aluminum pipe and steel flanges to prevent electrolytic corrosion
- 2** For wrapping copper instrument tubing in corrosive areas
- 3** For protecting underground piping from corrosion

Variety of applications in which tape is increasingly finding favor as a protective coating is illustrated by its use at the recently-opened polyvinyl chloride plant of General Tire & Rubber at Ashtabula, Ohio. Material, known as "Scotchrap" pipe insulation, was extensively used in the plant because it

provides positive protection from corrosion, with economy, ease of application, and safety. The plastic tape was used in three distinct applications, as follows:

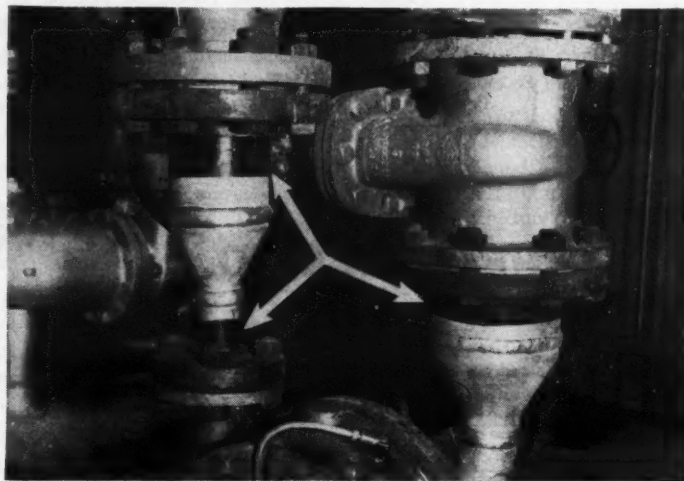
1—Tape was used as an insulator to prevent electrolytic action between two different metals

at flanges, permitting steel to be used.

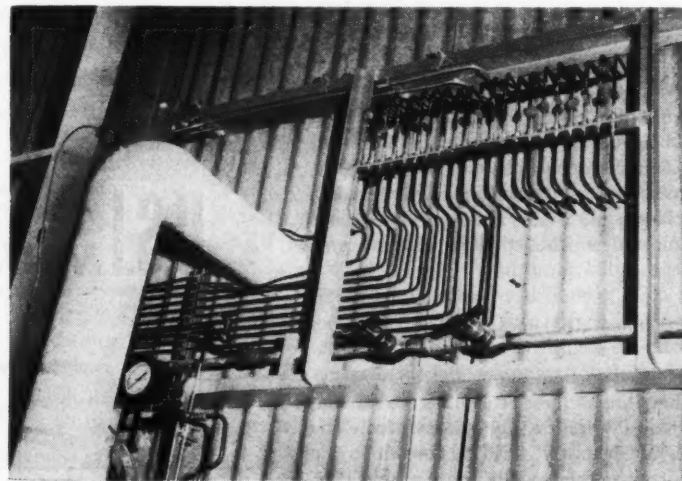
In one typical example of this use (Fig 1), the polyvinyl chloride tape was wrapped around portion of aluminum piping beneath carbon steel back-up flange, which is connected to a stainless steel valve. Tape prevents electrolytic action between the carbon steel flange and the aluminum piping. If tape had not been used, it would have been necessary to use a stainless steel back-up flange.

2—Second use of the polyvinyl chloride protective coating was for wrapping around instrument tubing and conduit in corrosive areas. In Fig 2 tape is shown protecting copper instrument tubing from HCl and possible acetylene fumes. Another example of this application (Fig 3) is use of the tape to protect conduit lines — power leads to the compressors and motor control lines.

3—Third and most extensive use of tape in plant



**Fig 1—Use of tape as a back-up insulator between aluminum piping and steel flange halts electrolytic corrosion, allows use of carbon steel flange**



**Fig 2—Wrapping of copper instrument tubing with tape protects it from HCl and possible acetylene fumes**



**Fig 3—Conduit in corrosive areas was also wrapped with polyvinyl chloride tape**



**Fig 4—Only 20 minutes was needed to wrap an 18" diameter joint**



**Fig 5—Taping plant**



Fig 5—Tape protects 8" acetylene supply line entering plant through pit outside compressor building

was for wrapping underground piping. All piping below 4" was completely wrapped. Joints and welds of piping 4" and above were wrapped with tape, remainder of line being Hill & Hubbell coal tar coated. All of the underground piping, about 6200', is protected with tape in this manner. This includes the 18" diameter (Fig 4), 1500' long raw water line, and the 8" acetylene line entering plant, as well as fire water system, cooling water, and process piping. Fig 5 shows tape protecting 8" acetylene supply line entering plant through pit just outside compressor building.

All of the tape was applied by hand since wrapping by this method was found to be very easy. Only 20 minutes was needed to wrap an 18" diameter joint, including cleaning prior to application. With the low labor requirement, tape was found to be an economical method of obtaining protection from corrosion. Since it was not necessary to use heat in applying the tape, danger of someone being burned was eliminated.

Since plant only went on stream in Oct. 1954, it is too early to obtain any performance figures on this particular installation as yet. However, tape used above ground in other chemical plants is still in good condition after four or five years. Estimated service life underground is considerably longer.

One reason excellent results are expected is the high adhesion of the material, an important factor in any coating. Tensile strength of the tape, plus good stretch characteristics, keeps it from breaking while being applied or from rupturing under soil stress.

Dielectric strength of 1000 volts per mil of thickness indicates material's ability to protect underground piping from electrolytic corrosion. This is also shown by the insulation resistance of 200,000 megohms. Tape has good resistance to transmission of moisture vapor and is inert to bacteria.

(Continued on next page)

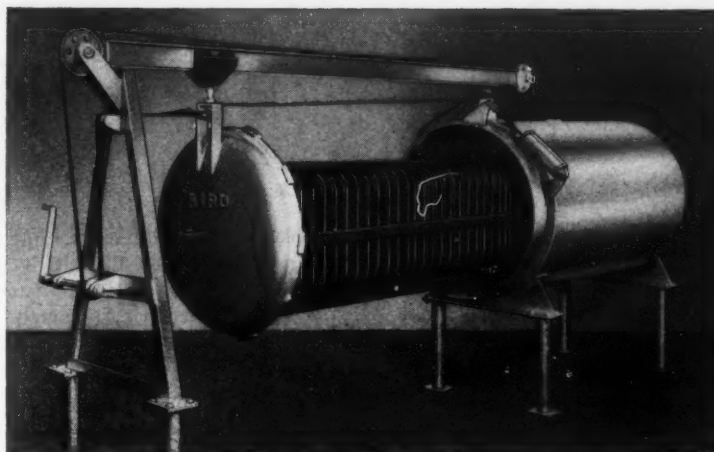
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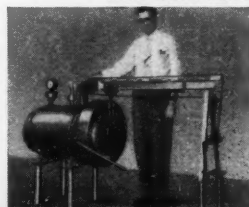
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\*This is the pilot size Pressure Filter



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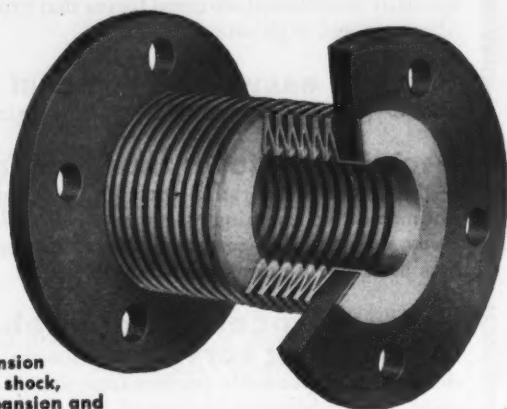
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## NEW SOLUTIONS of processing problems

(Continued from preceding page)

No. of squares (one square equals 100 sq ft) of tape required for a given amount of pipe are as follows:

2" pipe —  $\frac{3}{4}$  of a square per 100'

4" pipe —  $1\frac{1}{2}$  squares per 100'

8" pipe —  $2\frac{1}{2}$  squares per 100'

Plant was engineered and designed by Scientific Design Co., Inc., Dept. CP, 2 Park Ave, New York 16, N. Y.

("Scotchrap" pipe insulation is product of Minnesota Mining & Manufacturing Co., Dept. CP, 900 Fauquier Ave., St. Paul 6, Minn. . . or for more information about manufacturer's product, reader may simply check CP 5496 on the Reader Service slip which is located opposite last page.)

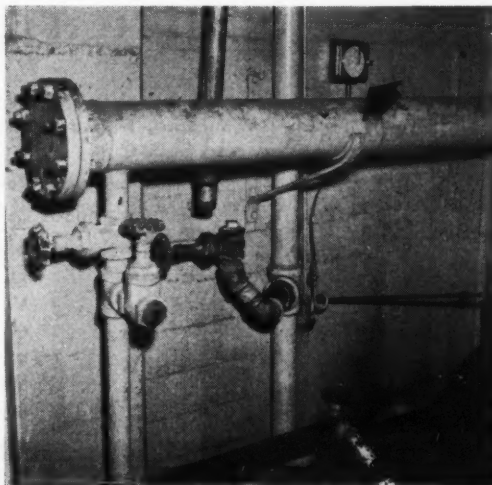
(For more ideas on how to fight corrosion, see section starting on page 98.)

### Tell when piping needs cleaning and how often pump operates with midjet recorder . . .

operated directly by line pressure, instrument is used safely in explosion hazard area

**Problem:** Unpredictable fouling of pipes plagued one department of Eli Lilly's big Indianapolis plant. Extracts dissolved in alcohol would sometimes plug these lines completely. When this happened there were delays. And continuous processes were held up while piping system was taken apart and cleaned.

**Solution:** In the summer of 1954 instrument men at the plant took a hand in clearing up this situation. They decided to check pressure on dis-



Midjet recorder is mounted on wall and connected directly to pump

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### in direct flow indication

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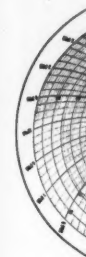
CHEMICAL PROCESSING

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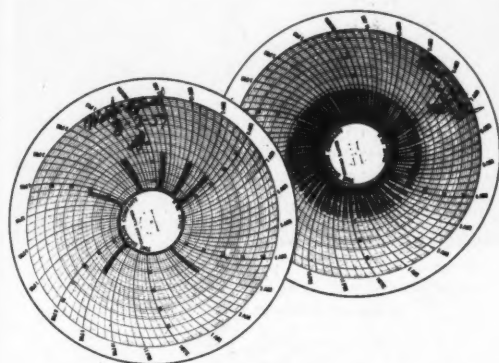
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charge side of pump feeding the lines which clogged. Because pump operation was intermittent, they also needed to know how long and how often pump was working.

This latter situation was complicated by explosion hazard in the area. Conventional electric operation recorders would have to have been explosion-proof for the installation.

But by using a spring wound clock in a small pressure recorder, both pump discharge pressure and operation frequency and duration could be measured. Such a recorder was installed. It uses a spiral Bourdon tube to move pen directly from pressure in the pipe line. Spring clock drives chart for one revolution every 24 hours.

**Results:** Frequency of operation, duration of operation, and back pressure on the pump are now easy to find from recorder charts. In charts pictured



Charts show frequency and duration of pump operation and back pressure

here, for example, it can be seen that pump operated two or three times an hour on July 28. On August 2 pump was only called on seven times. Note also that in the five days elapsed between these charts, back pressure on the pump had risen from 36 psi to 40 psi. This increased back pressure can signal for cleaning of pipe system during slack periods and eliminate shutdown because of unexpected plugging.

(Minicorder is manufactured by The Dickson Company, Dept. CP, 7420 Woodlawn Ave., Chicago 19, Ill. . . . or for more information check CP 5498 on Reader Service slip which is located opposite last page.)

Processing and Engineering Data  
starts on page 184



## Fine Finishes Reflect Great Sales Potential

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Buyers these days want finishes that won't mar, chip or fade . . . that resist burns, bending, stains, and aging. To build these characteristics into paint or enamel, you must select raw materials with the right combination of properties. General Mills fatty acids are alkyd "specialists."

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## STRATEGIC PURCHASING

*to help your company maintain  
a sound competitive position*

As profit margins tighten, your purchasing strategy becomes a vital force for success.

The way you purchase heavy chemicals, for instance, can influence your company's profits in the years ahead.

So it becomes increasingly important for you to seek every possible economic advantage when you select a chemical supplier.

Here, for example, are a few things to look for, when deciding on a source for caustic soda, chlorine, and other chemicals:

**1. Supply security.** How flexible are your supply lines? For instance, a supplier with plants located on deep water may be able to offer you a choice of rail or water delivery. This can insure you steady supply, in case of rail service interruption.

**2. Engineering help.** A supplier's

engineering staff can often be valuable to you when you are setting up a new chemical process or caustic and chlorine handling systems—not only with advice, but with actual design assistance.

**3. Smooth processing.** You'll find it helpful to work with the supplier's technical service men who visit you periodically. Often these men can spot potential problems and ward them off before they cause you trouble.

**4. Safety programs.** Your men can benefit from safety suggestions offered by your supplier. You should have on tap the latest in safety equipment, plus up-to-date information on safe handling of chemicals.

**5. Economy.** Choose a supplier who wants to help you cut your operating costs; who will go all the

way with you in arriving at the best, most advantageous method of shipping and handling for your conditions.

**6. Experience.** Above all, choose a supplier who is familiar with your industry. It takes years of experience to acquire an understanding of the problems you face, and the know-how to help you solve them quickly and economically.

Are you getting your fair share of these strategic purchasing advantages?

Many of our customers in the chemical industry feel that they get these advantages in buying from Hooker, a supplier of basic materials to the chemical industry for fifty years.

In the light of the growing importance of these factors, isn't this a good time to review your policies on sources of chemical supply?



1905—Half a Century of Chemicals

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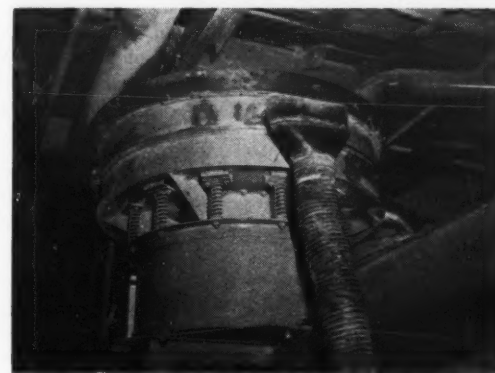
When inquiring check CP 5500 opposite last page

### NEW SOLUTIONS of processing problems

**Installation of gyratory screener  
assures uniform mixture,  
eliminates oversize . . .**

high quality of specialty product maintained  
at American Cyanamid

**Problem:** To insure product uniformity in the manufacture of Megasul at Fine Chemicals Division, American Cyanamid Co., Pearl River, N.Y., fine mesh soy bean meal was required. Fine mesh soy bean meal was needed so that nitrophenide could be mixed uniformly with it in order to produce a final product that would not segregate.



Gyratory separator at Cyanamid's Fine Chemicals Division handles 100 lb of material per minute, removing all particles over 10 mesh

Megasul consists of 75% oil-extracted soy bean meal and 25% nitrophenide. Product is used as an animal feed supplement for the prevention and control of coccidiosis in chickens.

**Solution:** About two years ago, company installed a gyratory screener, known as a Sweco separator, for use in the Megasul process. Gyratory motion of unit gives material a spiral action, providing highly efficient screening. Unit in use is 4' in diameter and 21½' high.

At Fine Chemicals Division, nitrophenide is added to the soy bean meal coming from a Tote Bin. The proportioned ingredients are then conveyed to the blender where the material is thoroughly mixed and finally conveyed to the gyratory separator where all particles over 10 mesh (.0742" opening) are removed. From separator, material goes to 9" screw conveyor, which transfers it to the bagging bin.

Reason that the mixture of soy bean meal and nitrophenide is screened instead of just the soy bean meal is to assure a final product of less than 10 mesh (.0742" opening) size. A negligible amount of material is screened out as oversize from each batch, not enough to alter the correct proportions of the ingredients. Screened material is ground and reprocessed.

Separator screens a batch of material at the rate of 100 lb per minute. Because of this high rate, it was necessary to enlarge discharge spout about 150% over standard size. Flange was also installed around top to prevent splashing. A 55 gal drum ring is used in the top of separator, which bounces around and knocks the mixture from screen, keeping it clean.

**Results:** Use of the gyratory separator has insured a uniform quality product. Separator has required no maintenance except lubrication.

(Gyratory screener is product of Sweco Separator Div., Southwestern Engineering Co., Dept. CP, 4800 Santa Fe Ave., Los Angeles 58, Calif. . . . or check CP 5501 opposite last page.)

#### Roadwork for Editors

Ever wonder why industrial editors "hit the road" so many days of the year? What determines where they go and who they see?

Plant openings, trade shows, society meetings are important. Many new developments first are introduced on such occasions. But the top-notch editor doesn't attend just these



events. He's constantly in touch with men in the field who are on top of these developments, waiting for the news to "break". CHEMICAL PROCESSING's editors spend much of their road time in plants, getting "New Solutions" stories . . . how a plant did something better.

Many of these "case history" stories started out with an article about a new product in our columns . . . a product of unusually high interest to our readers, as judged by their letters and checks on the Reader Service slip.

The follow-up story — of how the product performs in service — is the result of some editor's patient persistence until he gets permission to visit the plant.

It means more roadwork for the CP editor, but it means informative reading for the processing man.



# Keeping it SIMPLE

**HAMMEL-DAHL MAKES THE SAUNDERS VALVE  
AUTOMATIC  
— MAINTAINING ITS BASIC SIMPLICITY  
and LOW COST**

## Superstructure

- H-D ALLSTEEL  
SECURELY FASTENED TO BODY
- AIR-TO-CLOSE
- AIR-TO-OPEN
- PRELOAD (SPRINGLESS)  
THROTTLING CONTROL
- DUPLEX (SPRINGLESS)  
ON-OFF CONTROL

## Body

- SCREWED AND FLANGED ENDS
- GRINNELL OR HILLS-McCANN
- WIDE VARIETY OF MATERIALS  
FOR BODY, LINING, AND DIAPHRAGM
- SIZES ½" — 10"

COMPLETE  
Information in  
**Bulletin 108**

## HAMMEL-DAHL COMPANY



175 POST ROAD, (WARWICK) PROVIDENCE 5, R. I., U. S. A.



SALES OFFICES IN ALL PRINCIPAL CITIES

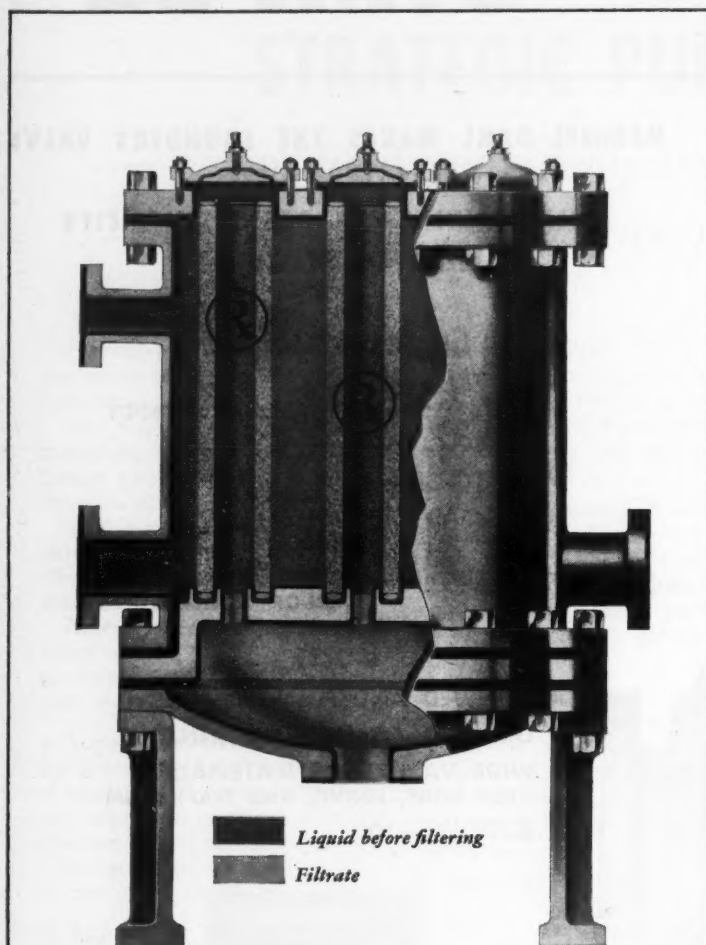
MANUFACTURING PLANTS IN WARWICK, R. I., U. S. A., CANADA, ENGLAND, FRANCE AND HOLLAND  
CANADIAN MANUFACTURING AFFILIATE—GUELPH ENGINEERING CO., GUELPH, ONT.

When inquiring check CP 5502 opposite last page

Another  
Norton

# R<sub>x</sub> on the job!

Outstanding performance of Adams filters  
aided by Norton seamless porous tubes



R. P. Adams Co. Filters, covering many chemical filtering services, deliver sparkling clear filtrate and insure quick cleaning without disassembly. Adams filters handling acid or neutral solutions are equipped with Norton seamless porous tubes, *engineered and prescribed* for faster, more thorough filtering and backwashing.

Besides assuring fast, thorough filtering action, Norton porous tubes are extremely easy to clean by backwashing. Here are several good reasons why they excel in these two primary essentials of efficient, economical filter performance:

- Norton porous tubes are made of ALUNDUM\* (fused alumina) *engineered* by Norton for chemical stability, inertness and other properties necessary to withstand acid, neutral and slightly alkaline liquors.
- Like all Norton ALUNDUM porous mediums they are made with the patented *controlled structure* process that assures even distribution of pores — for uniform passage of both filtering and backwashing liquids.
- They are *seamless*, providing unobstructed diffusion over their entire area — for further efficiency in both filtering and cleaning.

#### Other big advantages

of all Norton porous mediums include ease of installation and exceptional resistance to breakage and chipping. Available in sizes and open-pore ratios to meet your needs, they're *engineered* to last longer and cut your operating costs — and they're *prescribed* for a wide variety of chemical services, such as filtering water or solvents . . . cutting oils, wine, etc. . . reclaiming cleaning fluids and industrial waste . . . and for boiler feed water treatment.

See your Norton Representative for further facts or write, describing your requirements, to NORTON COMPANY, 562 New Bond St., Worcester 6, Mass. Canadian Representative: A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.



REFRACTORIES

*Engineered... R... Prescribed*

*Making better products...  
to make other products better*

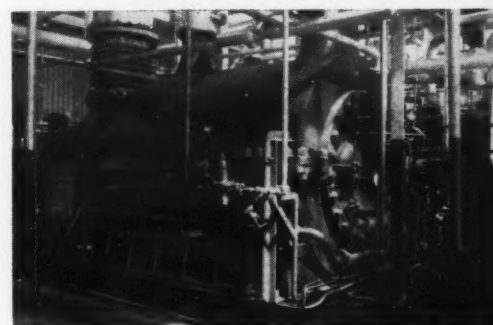
\*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

#### NEW SOLUTIONS of processing problems

##### **Centrifugal compressors used in ethylene plant to compress refinery charge gases**

One of the country's largest installations of turbine-driven centrifugal compressors is at Gulf Oil Corporation's Port Arthur, Texas, ethylene plant. Designed by the Lummus Company, it is the only ethylene plant known which is delivering its products directly to consumers by pipe line.

Plant features centrifugal compressors for charge gas compression, water injection for cooling to prevent copolymerization, and multi-nozzle single-casing compressors to accommodate large bleed-in



Centrifugal compressor uses water injection cooling

loads at pressure between initial suction and final discharge levels. Five steam turbines and one gas expander provide a total of 19,850 hp to turn five centrifugal compressors. Rotative speeds range from 5460 to 9140 rpm.

Design capacity of plant is 180,000,000 pounds of ethylene per year from refinery gases and gases resulting from cracking ethane. Three of the compressors handle charge streams in the process. Two of these units use water injection cooling to prevent compressed gases from polymerizing. Water is injected through spray nozzles into volute discharge passages.

Furnace effluent is compressed to recover additional ethylene from 15 psi to 260 psi. At 260 psi, desulfurized and carbon-dioxide-free refinery gases are added and the combined gases compressed to 720 psi.

Refrigeration needed in process is provided by the two remaining compressors. Closed system uses propane and operates at three different cooling levels: minus 10, 18, and 49°F.

(Compressors and turbines were furnished by The Worthington Corporation, Dept. CP, Harrison and Worthington Avenues, Harrison, N.J. Check CP 5504 on handy form opposite last page.)

For more information on product advertised at right, specify CP 5505 . . . see information request blank opposite last page. ➤

When inquiring check CP 5503 opposite last page

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## Unruly urea toes the line

At Deere & Company's towering new \$20 million Pryor, Okla., plant, Aloyco valves police the hard-to-handle corrosives involved in producing urea.

Picking Aloyco valves for this tough job came naturally to Foster Wheeler, designer and builder of the 260-ton-per-day unit — newest urea plant completed. These valves are famous for standing up under the worst kind of corrosive and erosive conditions in scores of leading

industrial processing plants.

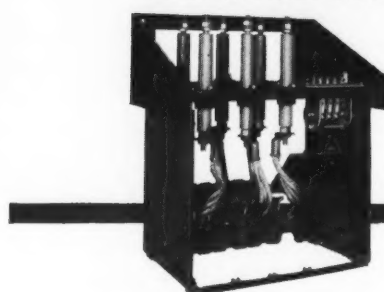
Alloy Steel Products Co., Inc., 1301 West Elizabeth Avenue, Linden, N.J.

5.2



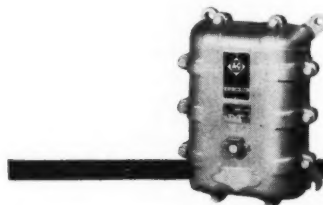
# These Safety Features

## meet operating demands of combustible atmospheres



### Oil-immersed main contactor for safe operation

The complete contactor, including magnet and auxiliary switches, operates under oil to prevent sparks from igniting atmosphere and to protect mechanism from corrosion.



### Relays and switching devices in explosion-proof cases

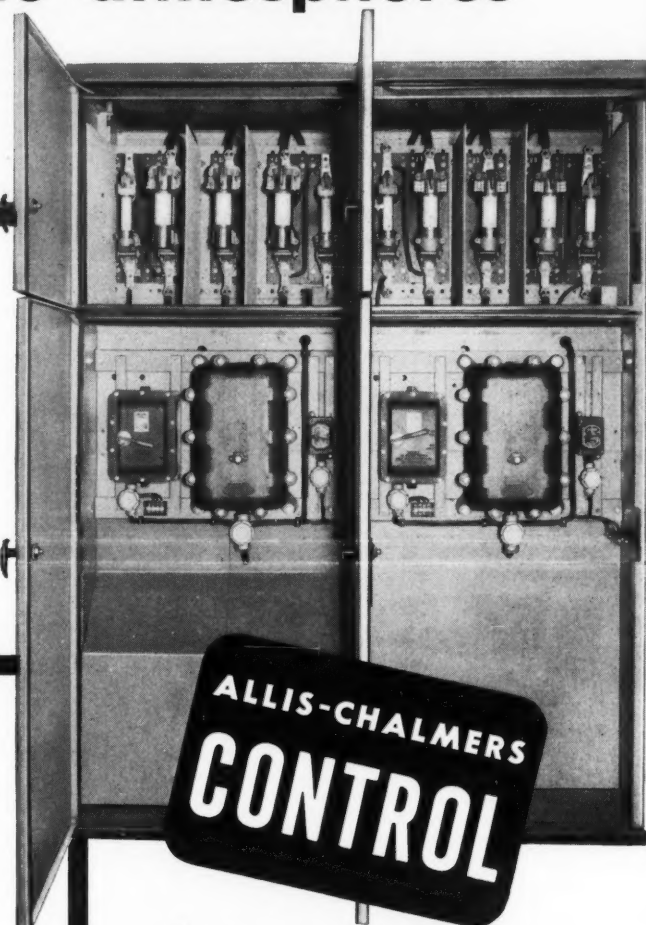
Further protection against the possibility of explosion is provided by NEMA VII enclosure which houses all overload, under-voltage, timing and auxiliary control relays as well as other low voltage switching devices.

### Interlocked fuse compartment door

The fuse disconnect door is interlocked. The line contactor must be opened before access to the fuse is possible.

**Other features** *Steel barriers* in rear compartment prevent accidental contact with high voltage parts. Enclosure is finished with corrosive-resistant paint. Indoor or outdoor control equipment may be provided.

A-4583



*Industry-Engineered*  
**for Semi-Hazardous Locations**

Type H starters for 2300 to 5000-volt motors

For complete information, see your Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wis.



# ALLIS-CHALMERS

When inquiring check CP 5507 opposite last page

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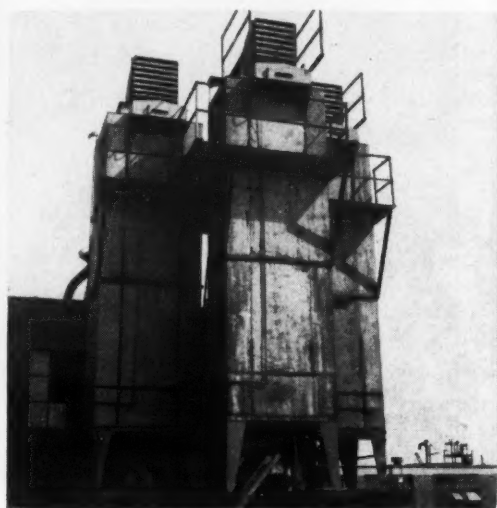
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**Increased product recovery  
pays for dust collectors  
in two years . . .**

self-cleaning reverse-air-jet filters are used by  
Borden Company — Chemical Division

**Problem:** Valuable product was lost by former dust collectors used at The Borden Company — Chemical Division, Philadelphia, Pa. Material that was recovered was in sludge form making it difficult and costly to prepare for reuse.

**Solution:** A total of nine Aeroturn dust collectors, Series 18 and Series 12 types, were installed starting in the year 1950. Photo shows three collectors with total capacity of 12,400 cfm.



Dust collectors employed at The Borden Company for recovery of fine material from processing operation

Dust collectors employ the Hersey reverse-air-jet principle. Blow-rings travel up and down outside the filter. Air jet from blow-rings dislodges dust from inside of filter. Dust drops down to hopper. High air-cleaning efficiency is obtained by filtering out particles down through the sub-micron range.

Collector is compact and is delivered as a unit, facilitating installation. Standard sizes have air handling capacities from 1000 to 60,000 cfm, with 4 to 64 bags up to 18' high.

**Results:** Value of increased material recovered has been sufficient to pay for all of the collection equipment within two years of installation. Borden's experience with the collectors has been generally excellent. One unit was found to be too small for the application, making the installation of additional collector capacity necessary.

(Aeroturn dust collectors are manufactured by Turner & Haws Engineering Co., Inc., Dept. CP, 87 Gardner St., W. Roxbury 32, Mass. . . or for more information check CP 5506 opposite last page.)

# CHIKSAN takes a Compressor's Pulse

## Keeps Gas Flowing— Absorbs Vibration of Changing Pressures



NOT only do the stamina and flexibility of Chiksan Joints take expansion in their stride, they absorb pulsation and vibration. When the Plymouth Oil Company wanted a better way to handle the expansion and contraction of its 2500-3500 lb. natural gas re-pressuring line in its compressor station in Sinton, Texas, back in 1946, it tried Chiksan 2-inch high pressure ball bearing swivel joints. So successful were Chiksan Joints in this application, they were adopted for 3 and 4-inch lines for the same purpose. In addition, by placing regulators, gauges and other recording equipment on a bridge

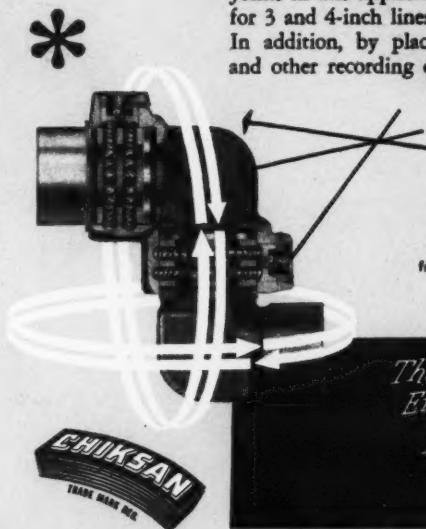
using Chiksan Joints, accurate readings of the instruments could be obtained.

Since 1946, not one of these Chiksan Joints has been replaced or even repacked, and they are giving the same economical, dependable service they did when first installed.

In Texas or California—all over America and all around the world—wherever production, processing or distribution depends on the flow of liquid or gas or on the dependability of hydraulic systems, there you will find Chiksan Ball Bearing Swivel Joints on the job—adding muscle and flexibility—cutting down on shut-downs and maintenance.

Whatever your business, if gas or liquid plays a part, Chiksan's Research and Development Division can help you add efficiency, safety and economy to your operation.

Representatives in Principal Cities  
Write for Catalog 53-C, Dept. CP-3



CHIKSAN Ball Bearing Swivel Joints are THE NEW TOOL of Modern Industry—with full 360° rotation in 1, 2, and 3 planes. Over 1,000 different types, styles and sizes have been developed for pressures and services from 28" vacuum to 15,000 psi and for temperature ranges from minus 75° to a plus 500° F. with packing materials for each specific type of service.

The Flow of  
Enterprise  
Relies on

# CHIKSAN

Ball-Bearing  
Swivel Joints

CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 28, Illinois • Newark 2, New Jersey  
Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Chiksan Export Company (Subsidiary), Brea, California • Newark 2, N.J.

When inquiring check CP 5508 opposite last page

## NEW SOLUTIONS

### **Chemical treatment cleans 5 filters in 6 hours . . .**

eliminates dismantling, bed  
replacement costs

**Problem:** Filter beds of pressure filters in company's water softening system had become dirty and partially plugged. Plant wished to avoid expensive and time-consuming job of removing beds from the five filters and replacing them with new filter material.

**Solution:** Chemical solvents were pumped into units until solvent level was about six inches above top of filter material. Solvents were allowed to soak until they ceased reacting with deposits that clogged beds. Beds were flushed with water after solvents were drained.

**Results:** Units were cleaned in less than six hours. Filters operated at near top efficiency after treatment.

(Filter cleaning service is performed by Dowell Incorporated, Dept. CP, P. O. Box 536, Tulsa 1, Oklahoma . . . or for more information on this service reader may simply check CP 5509 on convenient Reader Service slip which is located opposite last page.)

### **Case histories cited on dust control**

Case histories on dust control in pharmaceutical plants are presented in six-page folder. Complete with illustrations, examples cited cover use of collectors at tablet presses, packagers, mixers, dryers, and various types of materials conveying equipment.

Bul 550-D is issued by American Wheelabrator and Equipment Corporation, Dept. CP, 1036 South Byrkit Street, Mishawaka, Indiana. When inquiring specify CP 5510 on convenient Reader Service slip which is located opposite last page.

# Maintenance is lower and cle



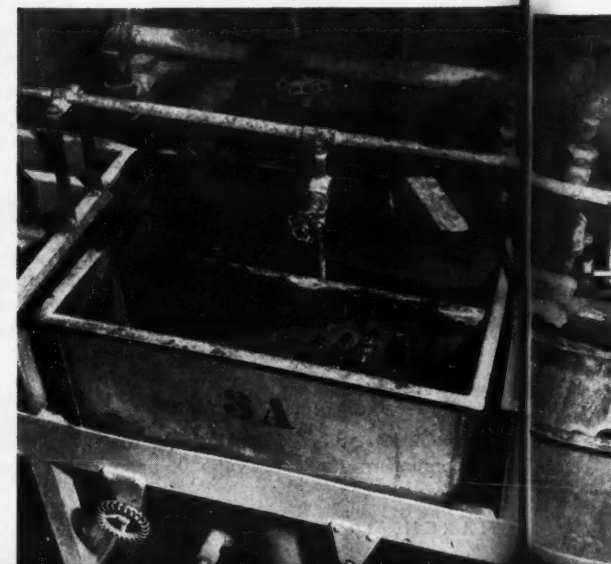
ALL STAINLESS STEEL EQUIPMENT at Davison Chemical Company (a division of W. R. Grace & Co.) was fabricated by Dixie Manufacturing Company, Baltimore, Md.

HYDRO-GEL is being emptied from a Stainless Steel settling tub into a Stainless wash tank.



WASH TANK is lowered into a larger Stainless Steel vessel for the washing operation.

STAINLESS STEEL WEIR BOXES regulate the flow of water to wash tanks.



# clean-ups are faster

## when hydro-gel is processed in Stainless Steel tanks

• BY REPLACING wooden settling tubs and wash tanks used in hydro-gel processing with Stainless Steel equipment, Davison Chemical Company, Division of W. R. Grace & Co., Baltimore, Md., has lengthened service life and made clean-ups quicker and easier.

In settling tubs, where hydro-sol solidifies into hydro-gel, Stainless Steel is replacing wooden tubs. The wooden tubs lasted six months to a year while Stainless is expected to last indefinitely. In addition, material doesn't adhere to Stainless tubs and time-consuming scraping and cleaning is eliminated.

Stainless Steel also has replaced metal-lined wooden tubs in the washing operation that follows. Stainless Steel's light weight permits one crane operator to handle these tubs where a crew of three was necessary to palletize the heavier wooden tubs. And the wooden tubs required maintenance on a weekly basis.

Water for the washing operation comes to the wash tanks from a Stainless Steel pH tank through one of six Stainless Steel weir boxes. The plant also makes extensive use of Stainless in piping and pumps.

Stainless Steel offers so much—corrosion resistance, long life, ease of cleaning, freedom from contamination—that it is a key material in almost any type of chemical processing operation. Make full use of its economy and when you do be sure you get service-tested USS Stainless Steel.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

### USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS  
PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO  
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

STAINLESS WASH TANKS are at the left and at the right is a Stainless Steel tank where water is treated for the proper pH rating.

USS

UNITED STATES STEEL

### Toxic parathion eliminated by wire mesh section in scrubber stack . . .

air flow not obstructed, pressure drop less than 1"

**Problem:** Toxic parathion dust concentrates leaking through cloth air filters presented a serious problem to engineers of a major insecticide blending plant. Since parathion has a low vapor pressure and is readily hydrolyzed at high pH, system also included provisions for scrubbing with caustic.

Although caustic scrubbing in combination with the filtering action did good job of blocking passage of the 325-400 mesh articles, there was difficulty in containing parathion-bearing caustic within scrubbing tower. Mist of noxious caustic material hovered over scrubber stack.

**Solution:** Engineers installed a wire mesh entrainment section in the 18" diameter stack. Pad was fabricated of fine monel wire, knitted to a three-dimensional pattern, 6" in thickness. Section was fastened to 1/4" support bars inside stack with several lengths of monel tie wire.

**Results:** Entrainment section eliminated caustic mist completely. Air flow (about 1100 cfm) has not been obstructed and pressure drop through scrubber and separator is less than 1" water gage. When sufficient dust collects on section to cause noticeable back pressure, separator is quickly hosed down with water and production is immediately resumed.

(Wire mesh entrainment sections are product of Otto H. York Co., Inc., Dept. CP, 6 Central Avenue, West Orange, N. J. . . . or for more information check CP 5511 on handy Reader Service slip which is located opposite last page.)

◀ For more information on product at left, specify CP 5512 . . . see information request blank opposite last page.

**LEADS IN SPEED—  
and Thoroughness**



**The  
PATTERSON  
THOROBLENDER**

*for every type of blending  
with free-flowing  
dry materials*

Thoroughly equipped for a thorough job of blending—on your materials in your manufacturing process. See the difference between Thoro-Blender performance and any other machine—send us sample materials for complete blending report.



*Richard L. Cunningham*  
President

WRITE for our detailed  
Thoro-Blender Brochure

**The Patterson Foundry and Machine Company**  
East Liverpool, Ohio, U. S. A.

NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI,  
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SEATTLE

**The Patterson Foundry and Machine Company, (Canada) Limited**  
Toronto, Canada  
MONTREAL

**new solutions  
of processing problems**

Corrosion and metal flaws are no longer unknowns. Carbide and Carbon Chemicals uses ultrasonics to . . .

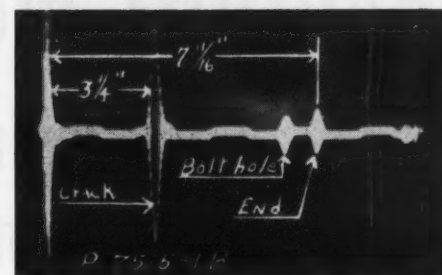
**anticipate  
equipment  
failure**

Testing program, now in fourth year,  
has paid for investment many times over

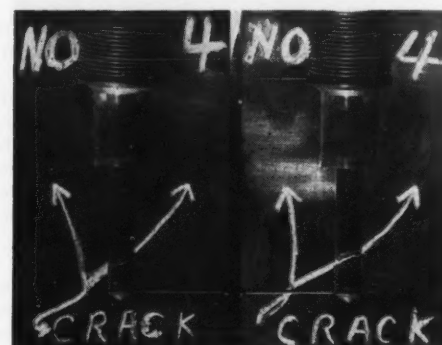
**FRANK C. PARKER**, Process Safety Dept.  
Carbide and Carbon Chemicals Company  
with **BRUCE FADER**, Associate Editor

**Problem:** Always concerned with industrial safety, Carbide and Carbon Chemicals Company believes in thorough testing of high pressure equipment.

Compressors and high pressure piping in its plants could be dangerous. Continuing checks become more important since recent practice has replaced complete



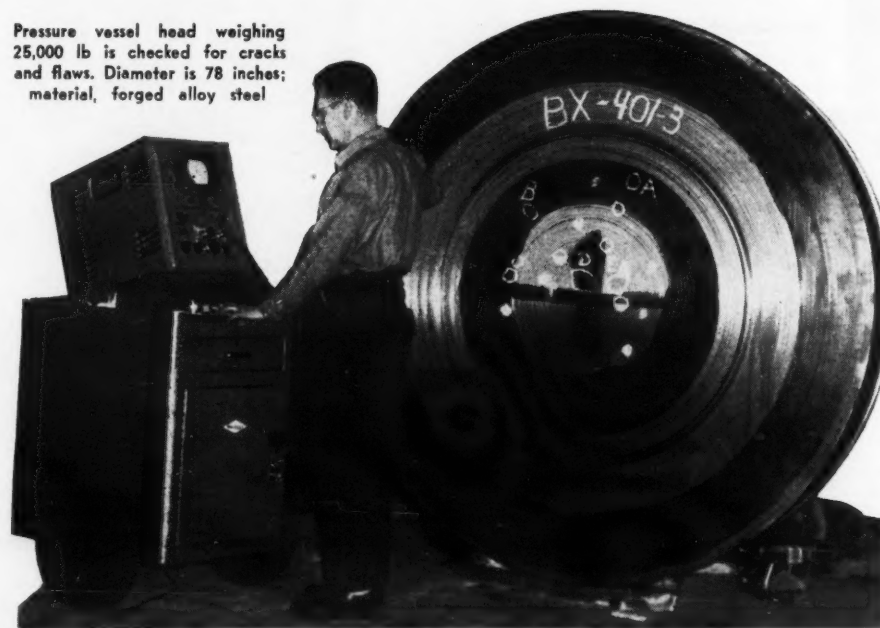
Test indicated crack 3/4 inches from top. When pump body was sawed in half later, crack was found



radiographic inspection with spot checks and hydrostatic test pressure has been reduced from 2 to 1 1/2 times rating. There is some feeling too that today's workmanship is inferior to that of ten years ago.

Executing these tests, however, was a time consuming and difficult procedure at Carbide plants. Multi-ton

Pressure vessel head weighing 25,000 lb is checked for cracks and flaws. Diameter is 78 inches; material, forged alloy steel



When inquiring check CP 5513 opposite last page



This tankcar looked normal — but test showed 57 inches of cracked weld at end

compressors cannot be taken apart at a whim. Spot checks of piping and pressure vessels by drilling left doubts about the portions which were not drilled.

**Solution:** In 1949 a seven-inch diameter piston rod on a 4500 psi compressor failed. As a result of this, an ultrasonic flaw detector was rented and tried out for inspection of heavy machinery parts.

Producing pulses of ultrasonic sound waves which are beamed through the part under test, the Reflectoscope draws a chart on a cathode-ray tube showing location of flaws. Notched markers of the trace indicate distance along path of ultrasonic pulse. "Pip" at left end of trace shows pulse entering the piece. "Pip" near center of trace is a reflection from a fatigue crack (in this case in a pump body). "Pip" at extreme right shows far end of body. By using notches for measurement, crack or flaw can be located closely.

Another piece of ultrasonic test equipment which had been in use at Carbide even earlier is the Audigage. It is used in measuring thicknesses of pipe and tank walls from one side. In place of ultrasonic pulses, this instrument produces a steady ultrasonic signal. Frequency of this signal is tuned until tank or pipe wall under test resonates to it. Since the speed of sound is constant, resonant frequency indicates thickness of the wall. Completely non-destructive, test enables thin spots to be found without any drilling and without any service interruption. It is easy to use in determining thicknesses from less than 1/16" to more than an inch. A conversion scale concentric with frequency scale of the instrument enables operator to read thickness directly.

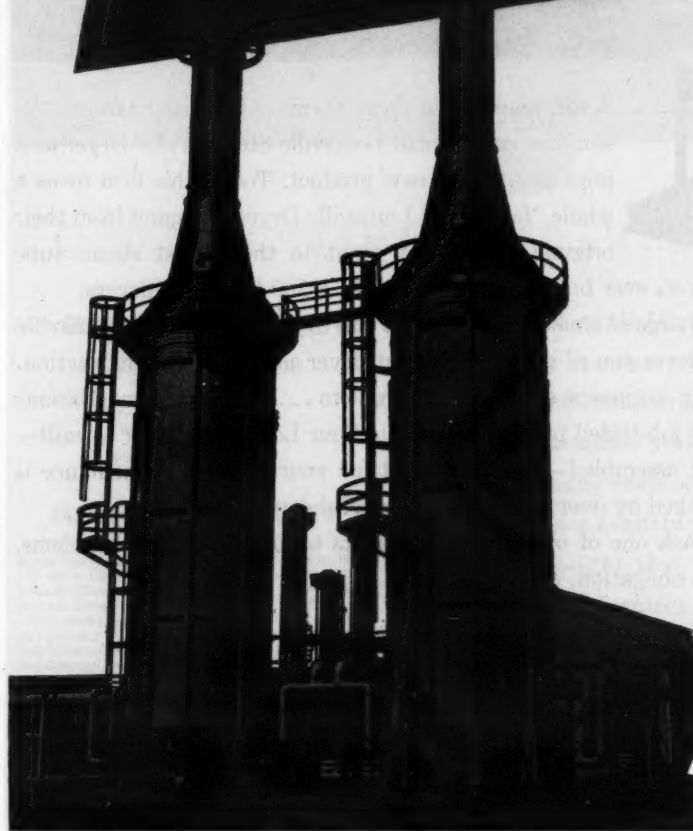
Ultrasonic tests have been incorporated with routine preventive maintenance. Compressors, for example, are dismantled about every 24 months for checking.

(Continued on next page)

*Petro-Chem Development Company Reports:*

## No Shutdowns for Refractories Maintenance

IN OVER  
1200 FURNACES



In 1940, the Petro-Chem Development Company lined their first Iso-Flow furnace with B&W Insulating Firebrick. Today, over 1200 installations later, (some with fluid outlet temperatures over 1600F) not a single furnace has ever been shut down because of the need for refractory maintenance.

Long life is just one reason furnace builders, as well as furnace operators, insist on B&W IFB. Here are four more:

### CUT INSTALLATION COSTS

B&W Insulating Firebrick are easy to install. They can be cut, drilled or shaped on the job with ordinary woodworking tools. Their lightness makes them easy to handle.

### ELIMINATE EXPENSIVE ALLOYS

Because of their high insulating values, B&W Insulating Firebrick can be supported or anchored with ordinary carbon steel. Expensive, heat-resisting alloys are not necessary.

### REDUCE DOWN-TIME

These brick have low heat storage, cool off quickly. This makes possible quick access to the furnace for inspection. They heat up quickly to get back on the line, too.

### CLOSE TEMPERATURE CONTROL

Due to the low heat-storage capacity of B&W IFB, their hot-face temperature responds quickly to changes in the rate of heat input to the furnace — insuring the closest possible temperature control.

You, too, can profit by this four-way economy of B&W Insulating Firebrick. Ask your B&W representative for all the facts on these cost-cutting refractories. He'll be glad to discuss your refractory problems with you.



**B&W REFRACTORIES PRODUCTS**—B&W Allmetal Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick  
**B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS**—Stationary & Marine Boilers and Component Equipment...  
**Chemical Recovery Units ... Seamless & Welded Tubes ... Pulverizers ... Fuel Burning Equipment ... Pressure Vessels ... Alloy Castings**

B-448

When inquiring check CP 5514 opposite last page

# Louisville Dryer "Family" boosts production, cuts costs

## Louisville Method for chemical manufacturer

Dryer Types Installed  
in one Plant Since 1933



10 ft. x 100 ft. size  
largest ever built!

Pilot Dryer  
38 in. x 25 ft. size

Some years ago a large chemical company bought the smallest commercial Louisville Steam Tube Dryer as a pilot plant for a new product. Today this firm owns a whole "family" of Louisville Dryers, ranging from their original small pilot plant to the largest steam tube dryers ever built, Louisville's 10 ft. x 100 ft. rotary dryers.

Large or small, there's a *right* size dryer for your job. Louisville relieves you of guesswork about dryer size, type or construction. Our engineers survey your problem . . . their recommendations are job-tested in our pilot plant. Your Louisville Dryer is *built*—not assembled—and built right for your job. Its performance is backed by over 50 years of successful drying experience.

Ask one of our drying specialists to look over your problems. No obligation, of course.



### GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer Sales Offices: 139 So. Fourth Street, Louisville 2, Kentucky • 380 Madison Ave., New York 17, New York

General Offices: 135 So. LaSalle Street, Chicago 90, Illinois

In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario

OFFICES IN ALL PRINCIPAL CITIES

LOUISVILLE DRYING MACHINERY UNIT

When inquiring check CP 5515 opposite last page

### NEW SOLUTIONS of processing problems

(Continued from preceding page)

Ultrasonic inspection at this time is part of the routine. It is especially valuable for locating fatigue cracks and other faults which are not apparent. Tanks, pipes, and high pressure vessels are inspected on a routine basis also.

**Results:** Success of this method can be judged from the fact that Union Carbide and Carbon Corporation now uses nine of each of the instruments described above plus several other special ultrasonic testers. In the opinion of the testing department the investment in ultrasonic testing equipment has paid off about twenty times over in the four years this program has been in operation.

Tests on compressor piston rods have so far located 13 cracked rods before they failed. While operating savings from this are evident, it is difficult to put a dollars-and-cents value on accident protection value. In many cases fatigue cracks in bolts subject to stress reversals have been found. Again, accidents as well as downtime have been averted. General findings indicate that bolts under heavy reversing load have a life of one year and up. Less heavily loaded bolts last three, five, or even ten years.

In checking a suspect tankcar, 57 inches of peripheral end weld (total 240 inches) was found to have hairline cracks. Some of these were 1/2 inch deep — penetrating internal bead. Failure would have been hazardous and costly.

Maintenance of the instruments is not especially difficult and has been carried out by the special Instrument Department of the Company.

(Reflectoscope is a product of Sperry Products, Inc., Dept. CP, Danbury, Conn. . . . or for more information check CP 5516 on handy form opp. last page.)

(Auidgauge is a development of Branson Instruments, Inc., Dept. CP, 430 Fairfield Ave., Stamford, Conn. . . . or for more information check CP 5516A on handy form opposite last page.)

(For more tips on instrument developments and uses, see section starting on page 84.)

### Resists temperature changes between 120° and 212°F in lactic acid production . . .

corrosion-resistant pipe is easily installed, and requires no special handling

**Problem:** Previous corrosion-resistant pipe cracked when subjected to repeated thermal shocks in the lactic acid production unit at Clinton Foods Inc., Corn Processing Div., Clinton, Iowa. Temperature changes between 120° and 212°F were encountered, in addition to the corrosive effect of the liquid — 50 to 90% food and technical grade lactic acid.

## NEW SOLUTIONS of processing problems

**Solution:** Haveg 41 pipe and fittings were specified about 5 years ago to replace pipe that failed. Haveg 41, molded from a composition of acid-digested asbestos fiber and phenol-formaldehyde resin, is resilient and strong. No special precautions had to be taken in handling or installation, and no braces or supports were needed.



Cut and notched in field, pipe was assembled using split metal flanges

Supplied in ten-foot lengths, pipe was easily cut in the field, and tapered grooves were turned on a lathe at point of installation. Pipe and fittings were connected using split metal flanges, bolted together. A rubber gasket was used. In this installation, 2-2½ inch pipe was used.

Some type 316 stainless steel flanged globe valves were used. Direct connection between valves and Haveg pipe was easy, as all bolt circles of flanges were ASME standard.

**Results:** Haveg 41 pipe has performed well; no cracks have developed, and the material is not affected by the action of the lactic acid. This results in no product contamination.

(Haveg pipe and fittings are products of Haveg Corp., Div. Continental-Diamond Fibre Co., Dept. CP, Marshallton, Del. . . or for more information check CP 5517 on handy form opposite last page.)

★ ★ ★  
"THAT'S INTERESTING"

Telegraph network capacity  
is 24,000 words per hour

Mathieson Chemical Corp. recently inaugurated a high-speed private wire telegraph network that covers 15 states and interconnects 31 Mathieson plants and offices in 23 cities. Immediate communication with any point on the wire circuit from any other station is possible. The system has a capacity of 24,000 words per hour to speed the flow of messages.



## CONO CONTROL VALVES . . . for water treatment

### SPECIFIED BY THESE FIRMS (partial list)

Belco Industrial Equipment Div., Inc.  
Cochrane Corporation  
General Filters, Inc.  
Graver Water Conditioning Co.  
Hungerford & Terry, Inc.  
Inflico, Inc.  
Illinois Water Treatment Co.  
Permutit Co.

### INSTALLED IN THESE PLANTS (partial list)

|                                       |                         |
|---------------------------------------|-------------------------|
| Atomic Energy Commission              | Arco, Idaho             |
| J. T. Baker Chemical Co.              | Phillipsburg, N. J.     |
| Blockson Chemical Co.                 | Joliet, Illinois        |
| Buckeye Cellulose Corp.               | Foley, Fla.             |
| Consolidated Edison Corp.             | New York                |
| Dow Chemical Co.                      | Freeport, Texas         |
| Dow Chemical Co.                      | Velasco, Texas          |
| Dow Chemical Co.                      | Pittsburg, Calif.       |
| E. I. duPont de Nemours & Co.         | East Chicago, Ind.      |
| Gulf Oil Corp.                        | West Port Arthur, Texas |
| Gulf States Utilities                 | Baton Rouge, La.        |
| International Business Machines Corp. | Endicott, N. Y.         |
| Johns-Manville                        | Manville, N. J.         |
| Penna. Power & Light                  | Shawmont, Pa.           |
| Philadelphia Electric Co.             | Schuylkill Station      |
| Shell Oil Company                     | Anacortes, Wash.        |

Cono Close Coupled Pneumatic Control Valves provide unbroken service day in, day out—year in, year out—in the automatic operation of demineralizers and other process systems. Hundreds of Conoflow valves, like those shown here, have been in operation many years without maintenance or repair. Cono Control Valves are available in assemblies for on-off service (guaranteed bubble-tight shut off) or for throttling control. Available with optional features such as handwheel type limit stops as shown, plastic position indicators, and micro-switch attachments for actuating remote visible or audible signals. Body sizes up to 12" in all materials—rubber lined, Saran lined, alloys, etc.

Write or phone for Conoflow's usual personalized attention.

## CONOFLOW CORPORATION

Foremost Manufacturers of Final Control Elements

2100 ARCH STREET, PHILADELPHIA 3, PENNSYLVANIA



When inquiring check CP 5518 opposite last page



## How you can cut filter downtime as much as 85%

It's simple with a Niagara Horizontal Filter. Here's why. After the hydraulically operated "Quick-Opening" cover is opened, a few turns of the windlass rolls the entire battery of leaves out on a retractable carriage, ready for instant cleaning. *One* man can drain, clean, close, fill and precoat in a matter of *minutes* instead of *the hours* needed for most other filters. That's why downtime can be reduced as much as 85% . . . why you get more productive filter time with a Niagara.

And your Niagara Horizontal will also give you:

- Two to five times faster filtration rates
- Complete elimination of cloth expense
- Labor costs reduced to a minimum
- Dry or semi-dry disposal—a few taps or shakes of the leaves easily drops the cake into a hopper

- Positive removal of solids to almost any degree
- Plus many other cost cutting, product improving features

Niagara Filters are available, either horizontal or vertical, in a wide range of capacities up to 40,000 G.P.H. They can be made of steel, stainless steel, nickel, monel or other corrosion-resistant materials . . . rubber or plastic lined . . . steel jacketed or insulated. Niagaras are constructed in accordance with ASME requirements—pressures to 75 PSI are standard but they can be built for pressures up to 280 PSI.

The savings you make with your Niagara will quickly pay for its entire cost. This has been proven time and time again in thousands of plants in diverse industries. For the full story, mail the coupon . . . no obligation.

**Niagara** FILTERS  
A DIVISION OF  
**American Machine and Metals, Inc.**  
DEPT. CP355, EAST MOLINE, ILLINOIS

☐ Have representative call ☐ Send catalog NC-1-53

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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Specialists in Liquid-Solids Separation

## NEW SOLUTIONS

### Electric heating cable stops foundry sand freezing, caking

Electric heating cable laid over sand pile at Lackawanna Foundry Company, Lackawanna, New York, prevents molding sand from freezing and caking during off-hours. Cable keeps sand just above freezing point.

Formerly, it was necessary to heat the sand by means of salamander stoves. Reconditioning of fine foundry sand in this manner meant considerable loss of time and extra labor. In addition, stoves produced noxious fumes that made working conditions unpleasant.

Cables are 80-ft long and have 400-watt rating. Both initial and operating costs are low.

(Thermwire is product of Edwin L. Wiegand Company, Dept. CP, 7517 Thomas Blvd., Pittsburgh 8, Pa. . . . or for more information check CP 5519 on handy form which is located opposite last page.)

### Cites six case histories of pipe cleaning jobs

Chemical method of removing deposits from pipe is described in illustrated four-page folder. Versatility, effectiveness, and speed are advantages cited. Where scale is not readily soluble, mechanical or high-pressure jet action techniques are used to supplement the chemical action. Six case histories of cleaning jobs performed are cited.

"A Solution to the Problem of Deposits in Piping Systems" is issued by Dowell Incorporated, Dept. CP, P. O. Box 536, Tulsa 1, Oklahoma. When inquiring specify CP 5520 on handy form opposite last page.

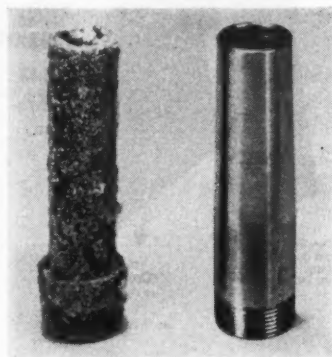
For more information on product at left, specify CP 5521 . . . see information request blank opposite last page.

## NEW SOLUTIONS

### Battery production upped when stainless nozzles fill sulfuric

An Eastern storage battery manufacturer uses 12% sulfuric acid (sp gr 1.080) as a battery electrolyte. The solution, ranging in temperature from 70 to 130°F, was formerly added to batteries through non-metallic nozzles.

Sometimes as many as ten of these nozzles broke per day. Production line shutdown often ran as high as 30 min to extract threaded sections of broken nozzles.



Type 303 stainless nozzle at left had to be replaced in two weeks, while special alloy nozzle at right shows no wear after nine months

Nozzles of Type 303 stainless steel were tried, and while they solved the breakage problem, they corroded so badly that they had to be replaced in two weeks. Finally, manufacturer tried a sulfuric acid-resisting steel known as Carpenter Stainless No. 20. Result has been vastly increased production with attendant savings in money and man-hours. Nozzles made from the No. 20 alloy have shown no sign of corrosive wear after nine months of service.

(Corrosion-resistant steel, Stainless No. 20, is a product of The Carpenter Steel Co., Dept. CP, Reading, Pa. . . . check CP 5522 on handy form opposite last page.)

For more information on product at right, specify CP 5523 . . . see information request blank opposite last page.

This Tolhurst Centrifugal with "all-speed" drive is used to determine best centrifuging speeds for photographic and fine chemicals. Photo courtesy of Ringwood Chemical Company, Ringwood, Illinois.

## How to find the best centrifugal speeds for your products

Determining the most efficient centrifuging speeds can help you lower manufacturing costs and increase production. For only the *right* speeds will make the proper degree of separation in the shortest time.

Tolhurst's "all-speed" hydraulic drive helps you establish the best basket speeds for loading, extracting, washing and unloading. You can select *any* speed from 0 to maximum RPM. Your tests show you which speed performs each operation most efficiently.

Or, do you have the problem of processing many different materials that have dissimilar filtering and washing characteristics? With "all-speed" drive, you can

process them all in the same Tolhurst Centrifugal.

You simply turn a handwheel to change speed. A tachometer indicates basket speed at all times. "All-speed" drive is now available on any Tolhurst Centrifugal. Baskets are 12" up to 108" in diameter and can be perforate or imperforate. Construction can be of steel, steel rubber covered, monel or other corrosion-resistant materials. For full information, write for illustrated catalogs.

**FREE CENTRIFUGING CALCULATOR**—A new slide rule for quickly calculating centrifugal force is yours for the asking.

**Tolhurst** CENTRIFUGALS  
A DIVISION OF  
**American Machine and Metals, Inc.**  
DEPT. CP355, EAST MOLINE, ILLINOIS

- ☐ Send new free centrifugal force calculator  
☐ Send catalog ☐ Have representative call

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**Specialists in Liquid-Solids Separation**

## Performing Seal!

Service that  
no other  
Mechanical Seal  
can match

Pump difficult chemicals...with drop-tight service over longer periods of time. That is what Chemiseal's chemically impervious TEFLON, pressure-balanced bellows design offers you.

The ideal Mechanical Seal that has no equal in handling acids, alkalies, solvents, hydrocarbons, alcohols—clear liquids, slurries and tarry materials.

### FEATURES

► **CHEMICALLY IMPERVIOUS TEFLON Bellows Section.** A selection of seal face materials dependent upon medium and service requirements.

► **SEAL ROTATES WITH SHAFT.** Only bearing surface is between precision ground rotating and stationary seal faces. Low friction load on shaft. Lower power cost. Drop tight service.

► **NO SCORING OF SHAFTS** and Chemiseals work satisfactorily on shafts previously scored by other seals or packing.

► **PRESSURES** at the seal up to 100 psi at 75°C or 75 psi at 100°C.

► **SIZES** from 1/8" to 2 3/8". Other sizes for special applications.

► **MAXIMUM LENGTH**, all seals 2 3/4".

Write for Bulletin No. MS-954.

UNITED STATES GASKET COMPANY, CAMDEN 1, NEW JERSEY

# USG

FABRICATORS OF  
FLUOROCARBONS & OTHER PLASTICS  
Representatives in principal  
cities throughout the world



When inquiring check CP 5524 opposite last page

## NEW SOLUTIONS of processing problems

**Teflon ring on ram-type valve  
withstands corrosive mixture  
of alcohol and caustic . . .**

design prevents plugging of outlet or resistance to flow of materials

**Problem:** Valves previously used for handling alcohol-caustic fusion mixtures were affected by the corrosive nature of the material, causing excessive maintenance. Valves were used in the manufacture of vat dyes at American Cyanamid Company's Bound Brook, N.J. plant.

**Solution:** When a new production unit was placed in service in Nov. 1952, a ram-type drain valve, which utilizes a Teflon valve ring, was used on the reaction kettle. In the closed position, the



Operator closes ram-type valve on kettle containing alcohol-caustic fusion mixture

piston or ram extends up into the tank, preventing plugging at the outlet. In the open position, with piston fully retracted, flow of materials from tank is not restricted. Valve is designed for bolting to existing flanges.

**Results:** Teflon valve ring enables valve to withstand the corrosive nature of the ingredients better than other valves used in the past. As a result, no maintenance whatsoever has been required on valve in more than two years of operation. Similar favorable experience has resulted with a number of other ram-type valves used for other operations in the plant.

(Ram-type drain valve is product of Strahman Valves, Inc., Dept. CP, 16-22 Hudson St., New York 13, N. Y. . . . or for more information check CP 5525 on handy form opposite last page.)

**CRUSH  
DRY ICE  
(SOLID CO<sub>2</sub>)  
to  
Speed Processing**

Takes Full  
50 lb. Cake



**SUPREME  
No. 301  
\$495.00**

Motor:  
1 1/2 h.p., 3 p.  
\$62.70

Flywheel  
and guard  
supplied.  
(Not shown)

Your Choice of  
Crushed Size —  
1/2" to 1 1/2"  
at 2 to 4 tons per hr.

### FOR THE CRUSHED SIZE YOU NEED

You get the maximum percentage of desired nodules at the size required with minimum of unusable fines. Larger capacity machine available. Can be supplied to produce 100% Powdered Dry Ice Snow.

### USERS OF SUPREME DRY ICE CRUSHERS

Drug Manufacture, Meteorology, Mercury Dies, Metal Shrinking, Rubber Parts Polishing, Dry Ice Converters to make CO<sub>2</sub> gas or liquid, Medical Pathology, Environmental Testing, Nuclear Physics, Vacuum System Traps, Chemical Processing, Food Preservation.



**No. 16 LABORATORY  
DRY ICE PULVERIZER**

Makes 100%  
Powder Rapidly  
From Chunks up to 3"

**\$120.00**

Motor, Switch, Cord; \$20.00

Since 1918—"Supreme" Standard Crushers  
For Any Material from Wax to Sponge Iron

# SUPREME CRUSHERS

Mfd. by Franklin P. Miller & Son, Inc.  
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When inquiring check CP 5526  
opposite last page

CHEMICAL PROCESSING

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**Top economy wanted in plant —  
dry-seal gasholders do good job  
of keeping costs down . . .**

hydrogen and nitrogen fed from them to Casale NH<sub>3</sub> process at Pennsalt

**Problem:** Keeping equipment and operating costs at a minimum was a necessity at Pennsalt's new ammonia plant, in Wyandotte, Michigan. Plant produces ammonia at the rate of 55 tons/day by the Casale process (CHEMICAL PROCESSING, September 1954).

Hydrogen, saturated with water vapor at comparatively high temperature, is obtained from adjacent chlorine-producing electrolytic plant. Anhydrous nitrogen is supplied by air separation plant in which nitrogen is separated by fractionation of liquid air.

The gases are catalytically united at about 950°F, under 9000 to 12,000 psi. Considerable moisture condenses out of hydrogen while it is being stored, so freezing up of the holder must be prevented. Since nitrogen is produced "bone dry", it is de-



Dry-seal gasholders serve as surge tanks for hydrogen and nitrogen gases at Pennsalt's Casale ammonia plant

sirable to keep it that way — thereby eliminating need for steam in nitrogen gasholder, and permitting economy in design of nitrogen compressing equipment by not having to provide capacity for handling water vapor.

**Solution:** Officials installed two Wiggins dry-seal gasholders for use as surge-storage tanks. Hydrogen is sent directly to a 60,000 cu ft (at 10" water gage) holder and nitrogen to a 20,000 cu ft (at 15" water gage) tank, from where they are fed into the main stream of the process.

(Continued on next page)

# 3-way answer to steam trap problems

• This three-way combination can help lick your steam trap problems.

**YARWAY IMPULSE STEAM TRAP . . .**  
the steam trap that gets equipment *hot in a hurry and keeps it hot*. Small size, light weight, body and all working parts of stainless steel. Low cost, low maintenance.

**YARWAY FINE SCREEN STRAINER . . .**  
with high-grade woven Monel wire screen that is removed with the cap for easy cleaning. Rust-proof finish . . . straight threads, machined faces and spark-plug type gaskets on screen caps.

**YARWAY ENGINEERING SERVICE . . .**  
32 trained YARWAY engineers working out of YARWAY branch offices from coast-to-coast, are constantly helping on *trap selection, installation maintenance and operation*. Solving your trap problems is their job. It will cost you nothing to call them in to assist you.

**YARNALL-WARING COMPANY**  
125 Mermaid Avenue, Philadelphia 18, Pa.

• YARWAY IMPULSE STEAM TRAPS AND STRAINERS are immediately available from more than 250 Industrial Distributors in the United States, Canada, and other countries. For name of one nearest you and **FREE Steam Trap Bulletin** write . . .



YARWAY Impulse Steam Traps. Over 900,000 successfully used throughout industry.

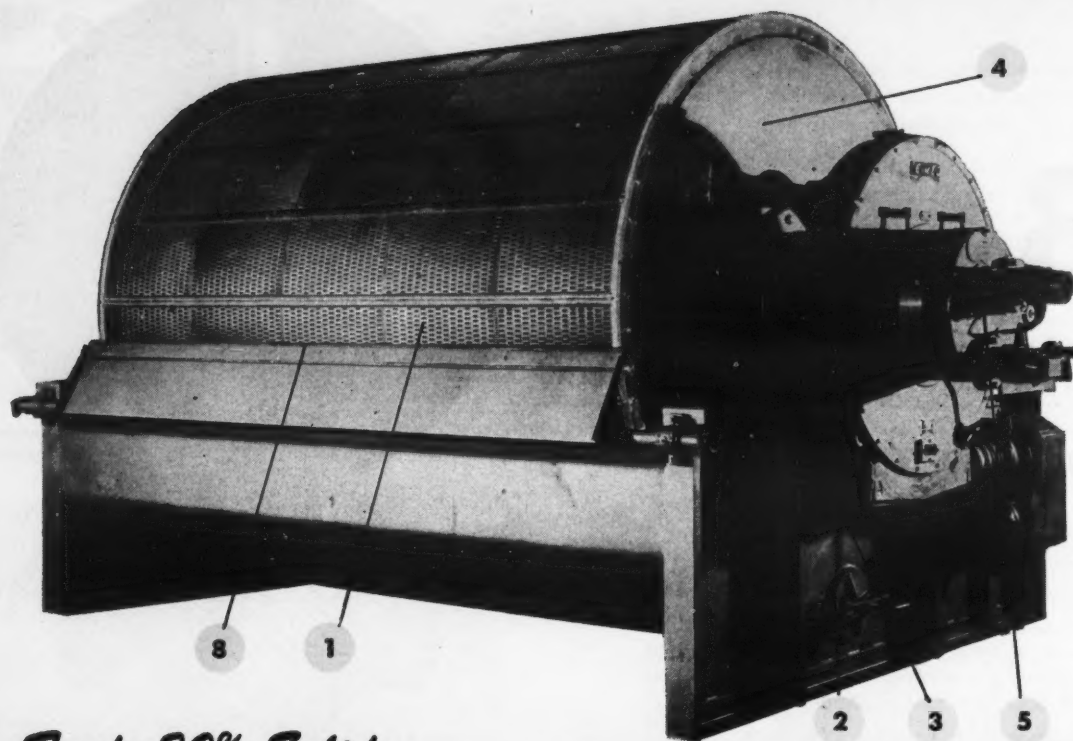


YARWAY Fine Screen Strainers. "Police the pipelines" in thousands of plants.



**impulse steam traps**  
And Yarway Fine Screen Strainers

When inquiring check CP 5527 opposite last page

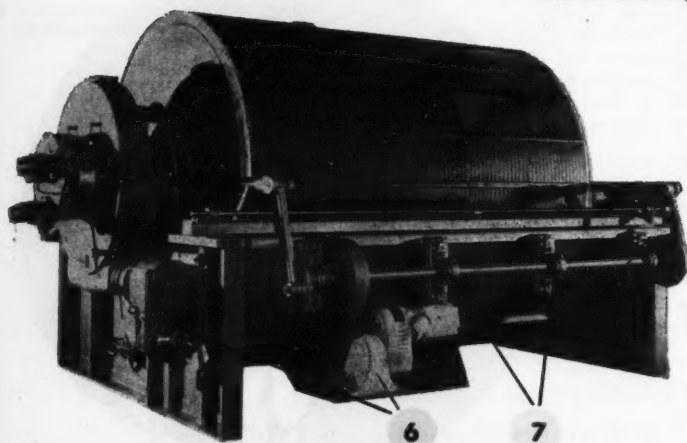


**Feeds 20% Solids--  
Cake 89% Solids**

This filter, a standard drum continuous vacuum filter design with most advanced features adapted for the customer's problem, incorporates such items as (1) rubber grids of thermo plastic type, (2) easy access through quick opening tank covers, (3) counterweighted pin type agitators, (4) steel drum-heads mastic coated, snap blow, rubber base plastic piping, (5) marine bronze valve and wear plate, (6) variable speed drives on drum and agitator, (7) anti-friction bearings on agitator shaft.

In operation a dutch weave wire cloth is caulked in the grooves and the snap blow lifts the cake from the panel away from the drum surface so that the (8) rubber tipped blade never touches the drum.

All Eimco filters are engineered and designed with the idea of prolonging cover or bag life. Eimco engineers will consult with you in the selection of the correct media for best filtration and longest life and supply you with samples of Eimco media for your own laboratory work or will advise you on shipment of samples to Eimco Research Center for free filtration analysis.



**THE EIMCO CORPORATION**

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*You Can't Beat An Eimco*

When inquiring check CP 5528 opposite last page

## NEW SOLUTIONS of processing problems

(Continued from preceding page)

Gasholder's operation involves no intricate system of rollers, guides, or delicate mechanisms. Annular space is completely sealed by nylon fabric coated on both sides with neoprene, eliminating the water seal found in other gasholders. As gas enters, piston rises and floats on gas. Piston continues to rise until it reaches position where its fender contacts girder of outer telescoping fender. From this position to full position, telescoping fender rises as a unit with the piston.

Seal rolls off fenders without rubbing or wearing as piston rises. Annular loop of seal surrounding piston and telescoping fenders prevents any rotation or horizontal shifting of the concentric members. Dead space between seal and shell of gasholder is less than 0.5% of total storage capacity. Internal clearances are such that possibilities of trouble from icing (from condensation from the hydrogen) are quite remote. Steam tracing condensate outlet at side of the holder and runoff piping seems to be all that is necessary.

**Results:** In the case of nitrogen, tank keeps gas perfectly dry. For both gases, amount of steam required to prevent freezing is very small in comparison to what would be required to keep seal water in conventional wet holder from freezing up. Keeping nitrogen dry also reduces water condensation load in compressor intercoolers by about one-fourth, which permits further savings of power and cooling water.

Officials state that inspection and maintenance costs for gasholders are practically nil. Heat, cold, ice, snow, and rain have no effect on their operation. Temperatures can range from -40 to +180°F.

(Wiggins gasholders are product of General American Transportation Corporation, Dept. CP, 135 S. La Salle Street, Chicago 90, Illinois . . . or for more information check CP 5529 on handy form opposite last page.)

### Here's a solution to that chemical material problem

If that process of yours needs a new chemical, then see the featured Materials section of April CHEMICAL PROCESSING. An alphabetical listing of chemicals introduced in 1954 plus a convenient "use-index" will be included to help you find what you want. The regular articles on materials will also be presented, and an authority in the field will "kick-off" the section with a Guest Editorial. Remember, it's in the Materials section next month. Don't miss it!!!

**Study column X-ray**

Better oils m rays t exam source bined up or laborat it is p larities ture.

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## NEW SOLUTIONS

### Study fluidization columns with X-rays . . .

may result in better gasolines, lubricating oils

Better gasoline and lubricating oils may result from use of X-rays to study fluidization. For example, by means of an X-ray source and an X-ray detector, combined in a unit that can be moved up or down entire height of a laboratory-scale fluidization column, it is possible to measure irregularities within the powder-gas mixture.

Non-uniformities within columns make for inefficient operation, and measurements like this facilitate studies for improving general operating efficiencies.

(Information summarized from paper presented before recent AIChE meeting by E. W. Grohse, Research Laboratory, General Electric Company, Department CP, One River Road, Schenectady, New York.)

### Trends in chemical, plastic, fertilizer industries

Economic trends in the chemical, plastic, and fertilizer industries are reviewed in 30-page book. Complete with charts and graphs, book discusses expansion programs, sales, expenditures, and other activities of various companies. Trend toward diversification in chemical field is also covered.

"The Technology Behind Investment" is issued by Arthur D. Little, Incorporated, Department CP, 30 Memorial Drive, Cambridge 42, Massachusetts. When inquiring about this book, specify CP 5530 on the convenient Reader Service slip which is located opposite last page.

For more information on product at right, specify CP 5531 . . . see information request opposite last page.

# 4

different types of  
**TRI-CLOVER** fittings  
used to solve specific  
Corrosion-Resistant  
piping problems for  
**ELI LILLY & COMPANY**



Eli Lilly's modern, efficient pharmaceutical plant at Indianapolis serves as an excellent example of the way in which some of the many types of Tri-Clover Stainless Steel Fittings are utilized to solve specific corrosion-resistant liquid conveying line problems.

With Tri-Clover and Eli Lilly engineers working together, the most efficient, economical type of fitting and line assembly was determined to meet each individual process requirement.

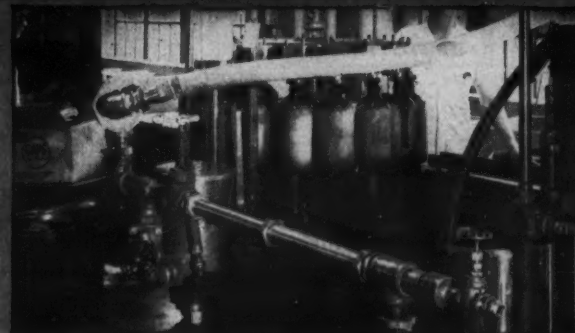
With a complete line of all types of highest quality stainless steel fittings, valves, pumps and tubing, plus experienced engineering service, Tri-Clover is extremely well qualified to help *you* solve your corrosion-resistant piping problems.

Call or write for further details.

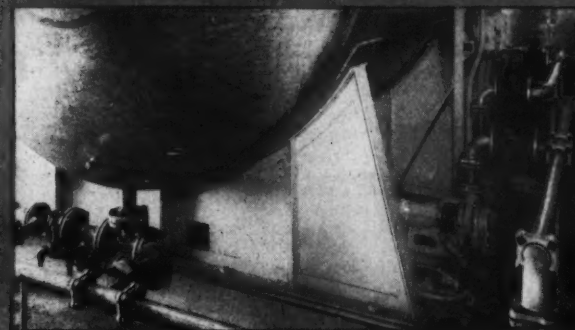
See your nearest  
TRI-CLOVER DISTRIBUTOR

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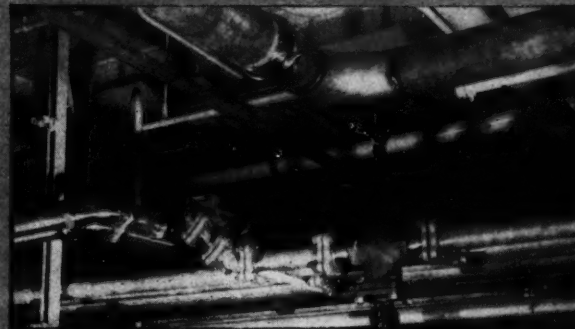
THE Complete LINE



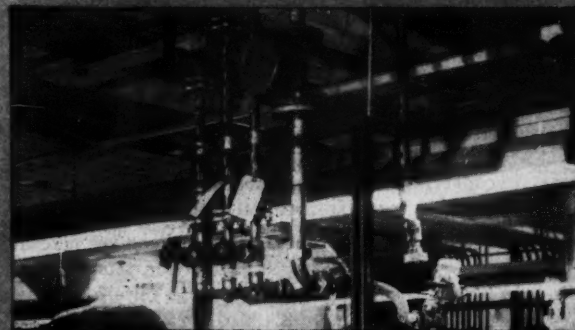
1 Polished sanitary type stainless steel fittings are used here in liquid transfer lines to a filling machine.



2 Tri-Clover stainless steel conical and fittings are used here in processing Pyrogen-free distilled water.



3 View shows Tri-Clover conical and, sanitary, industrial welding and Tri-Clamp fittings utilized in several different liquid transfer lines.



4 Here are liquid conveying lines to filling machines, utilizing Tri-Clover conical and, sanitary, and I.P.S. screwed stainless steel fittings.

2332

EXPORT DEPARTMENT—8 So. Michigan Ave., Chicago 3, U.S.A.

**Hydrogen peroxide-resin technique in its simplest form consists of replacing a sulfuric acid catalyst with an acid cation exchange resin that converts the peroxide and acetic acid to peracetic acid. Since the resin does not attack the epoxy ring under optimum reaction conditions —**

## single-stage technique improves yields in epoxidation of unsaturates

### Effect of temperature on $H_2O_2$ -resin epoxidation

(Methyl oleate treated for 1½ hr at 0.5:1 molar ratio of acetic acid to  $H_2O_2$ )

| Temp<br>°C | Epoxy-oxygen<br>content, % | Epoxide<br>Yield, % | By-product<br>Yield, % | Residual<br>iodine No. |
|------------|----------------------------|---------------------|------------------------|------------------------|
| 45         | 4.18                       | 85.7                | -0-                    | 12.4                   |
| 60         | 4.50                       | 92.2                | -0-                    | 6.9                    |
| 80         | 4.49                       | 92.2                | 4.3                    | 3.1                    |

#### FOOTNOTES TO TABLE:

"Alkane" hydrogen peroxide (50%, by wt  $H_2O_2$ ) was used, with Dowex 50-X-8, Amberlite IR-120, and equivalent resins. Methyl oleate had initial iodine number of 81.75

**Reaction takes place at 45-100°C and 0.5:1 molar ratio of acid to peroxide, looks like a good bet for commercial use**

**Uses:** Process epoxidizes unsaturated animal fats, vegetable oils, and their derivatives, using hydrogen peroxide and acetic acid in conjunction with cation exchange resin. Technique upgrades fats and oils, offering an improved method for converting these raw materials into more useful products, such as chemical intermediates.

**Features:** 1 — Increases epoxy content percentage even at relatively high reaction temperatures. Best viscosities for epoxy soybean oil are in range of 250-270 centipoises.

2 — Complete conversion to methyl epoxystearate is obtained, based on unsaturation removed, at temperatures of 45-80°C. At 80-100°C a small amount of by-product forms, but residual unsaturation is lowered. Products have good heat stability and low iodine value. Procedure can be adapted to give product desired.

3 — Practically all hydrogen peroxide is converted to peracetic acid. There is no peracetic acid build-up during epoxidation.

4 — Preforming peracetic acid or arranging for its storage is not necessary. This eliminates active oxygen losses.

5 — Costs of materials are decreased as resin can be reused as many as 25 times without loss of activity. If metal ion contamination is minimized, up to 100 reuses are possible, depending upon type of resin and its particle size. (Smaller particle sizes last longer.)

6 — Further, it is no longer necessary to neutralize the sulfuric acid catalyst formerly used. The small amount dissolved in the oil is easily and quickly removed. Acetic acid recovery losses are reduced.

**Description:** In this epoxidation method, an acid cation exchange resin, such as polystyrene sulfonic acid resin, acts as a solid catalyst in converting hydrogen peroxide to peracetic acid. For best results, resin must be in acid form.

Variables of time, temperature, and ratio of reactants all affect epoxidation reactions. However, with this resin technique they are not so critical. Reaction can be carried out with virtual elimination of by-product formation. Decrease of unsaturation corresponds with increase in epoxy content.

Reaction is generally complete in 1-3 hr. Epoxy yield does not rapidly decrease in longer times. Excellent yields have been obtained in 45-100°C range, but temp of 45-80°C are recommended. Tech methyl oleate can be epoxidized above 45°C with yields to 4.7 epoxy oxygen compared to 4.0 by ordinary procedures. Soybean oil goes as high as 6.6 epoxy oxygen, compared to 6.0 by other systems.

Almost identical conversions to epoxy compound are obtained at varying ratios of acetic acid to  $H_2O_2$ , but best results are obtained with a 0.5:1 molar ratio of acid to peroxide. (This information is given only for evaluation and is not to be taken as recommendation to infringe any patents.)

Ordinary mixing precautions must be considered. High-strength  $H_2O_2$  can be explosive if handled improperly. Types 403 and 316 stainless steels are satisfactory for use in reaction vessels.

(Epoxidation method is a technique developed by E. I. du Pont de Nemours & Co. (Inc.), Dept. CP, Nemours Bldg., Wilmington 98, Del. Check CP 5532 on handy form opposite last page.)

### Chemical cost of epoxy oxygen by $H_2O_2$ -resin epoxidation

(Costs based on 31.2# epoxystearate produced from methyl oleate at 100% recovery)

|                                       |         |               |
|---------------------------------------|---------|---------------|
| Methyl oleate                         | 29.6 lb | —             |
| 50% Hydrogen peroxide                 | 7.48    | \$1.94        |
| Acetic acid (glacial)                 | 3.3     | 0.33          |
| Resin (to be discarded after 25 uses) | 1.0     | 0.40          |
|                                       |         | <u>\$2.67</u> |
| Epoxystearate recovery (100%), lb     |         | 31.2          |
| Epoxy content (%)                     |         | 4.5           |
| Epoxy Oxygen (lb)                     |         | 1.41          |
| Chemical cost of epoxy oxygen         |         | \$1.90/lb     |

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## Stability to light, oxidation, resistance to fats, oils are features of latex

**moisture permeability permits paint  
films to breathe**

**Uses:** In formulations of water-base primer sealers, masonry finishes, and interior wall finishes such as semi-glosses and flat paints.

**Features:** Latex provides a number of properties to the paint formulator. These include chemical stability to light and oxidation, resistance to fats, oils, and greases, freedom from putrefaction, and excellent moisture permeability which permits a paint film to breathe when applied over damp surfaces.

Paints which are free from unpleasant or irritating odors can be formulated. These have good adhesion properties and ability to fill hairline cracks. Durability and weathering of films are excellent. Shelf stability is good.

**Description:** Polacet latex is a homopolymer of polyvinyl acetate, and has these properties:

|                                      |           |
|--------------------------------------|-----------|
| Solids (% min)                       | 55        |
| Bulk density (lb/gal)                | 9.2       |
| Viscosity (Brookfield @ 20 rpm, cps) | 1000-1500 |
| Particle size (microns)              | 0.5-1.0   |
| pH                                   | 3.5-5.0   |
| Monomer (% max)                      | 0.5       |

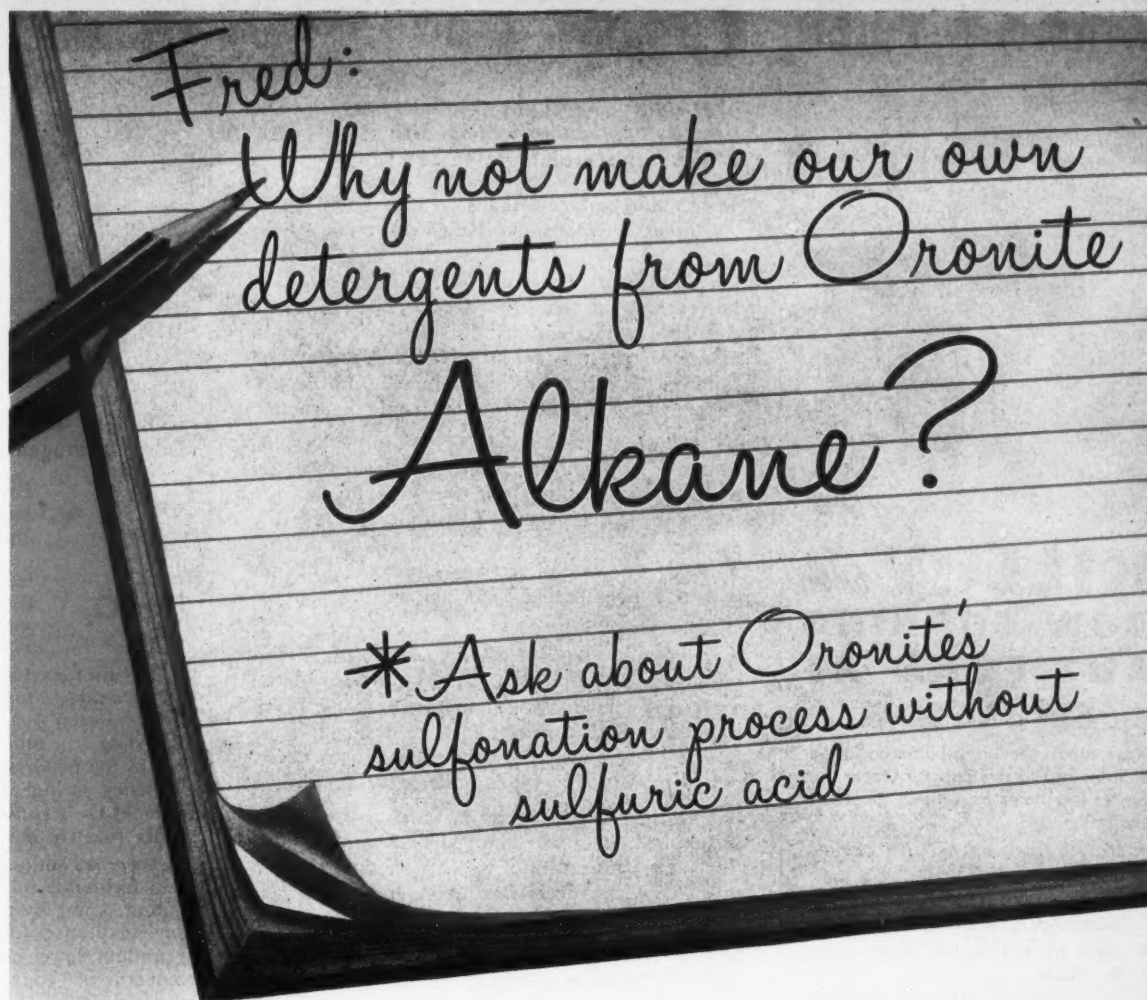
Latex requires post-plasticization, and yields clear, tough films that do not reemulsify. A stable system of compounding ingredients is easily obtained. Boric acid and its salts are to be avoided.

Suggested recipe for a white flat paint with viscosity of 76 KU and PVC equal to 34.6, is as follows:

|                          | Pounds | Gallons |
|--------------------------|--------|---------|
| Titanox RA               | 200    | 5.72    |
| Alisbronz 12             | 75     | 3.20    |
| Nytal 300                | 75     | 3.23    |
| Cellosolve               | 30     | 3.87    |
| R&R 551                  | 5      | 0.58    |
| Sterox CD                | 1      | 0.11    |
| 2% Methocel 400 cps      | 40     | 4.76    |
| 2-Ethylhexanol           | 2      | 0.29    |
| Water                    | 210    | 25.20   |
| Polacet latex, 55%       | 360    | 39.24   |
| Santicizer 160           | 20     | 2.15    |
| 2-Ethylhexanol           | 1      | 0.15    |
| 10% Sodium benzoate soln | 50     | 5.40    |
| 2% Methocel 4000 cps     | 60     | 7.14    |
| Butrol                   | 3      | 0.28    |

First nine of above items are blended, prior to grinding. Plasticizer should be slowly dispersed in the latex using a high speed agitator, until a complete uniform dispersion is obtained. After thorough grinding of pigment slurry, last six items are blended with good agitation until dispersed.

(PVA latex is a product of The Harshaw Chemical Co., Dept. CP, 1945 E. 97th St., Cleveland 6, Ohio Check CP 5533 on handy form opposite last page.)



If you are a volume user of surfactants or have plans to market finished detergent products it will pay you to discuss sulfonation with Oronite—the world's largest producer of the basic detergent raw material.

Oronite has a process design which eliminates the acid disposal problem inherent in so many systems. We also have plant designs, to fill any processing requirements, that will produce from one to 10 million pounds or more of finished product annually. You may discover sulfonation less costly than you think.



Contact any Oronite office for engineering and manufacturing data and assistance to accurately estimate your complete needs for sulfonation. It costs you nothing.



### OTHER ORONITE SURFACE ACTIVE AGENTS

Detergent Slurry • Detergent D-40 • Detergent D-60  
Dispersant NI-W • Dispersant NI-O • Wetting Agents

*"The world's largest producer of synthetic detergent raw materials"*

### ORONITE CHEMICAL COMPANY

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30 Rockefeller Plaza, New York 20, N.Y. • 20 North Wacker Drive, Chicago 6, Ill.  
Mercantile Securities Building, Dallas 1, Texas

When inquiring check CP 5534 opposite last page

## FOAM'S A THIEF



## KILL IT *with* DOW CORNING ANTIFOAM AF EMULSION

Now you're the boss! Foam no longer dictates productive capacity, output or processing times as witness these examples:

- strawberry concentrate cooling time reduced 25%.
- dairy saves 300-400 gallons of skimmed milk daily.
- yield on textile vat dyes doubled.
- vacuum concentration capacity increased 60%.

Effective at remarkably low concentrations against the widest variety of foamers, Dow Corning Antifoam A and the more easily dispersed Antifoam AF Emulsion are physiologically harmless; pay for themselves many times over because they • **eliminate the waste and fire hazard of boil-overs** • **reduce processing times** • **save the space previously wasted on foam in process equipment**

### see for yourself!

mail coupon TODAY for  
**free sample**

**DOW CORNING**  
**SILICONES**

Please send me data and a free sample of  
☐ Dow Corning Antifoam A  
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COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 5535  
opposite last page

## MATERIALS

**Short half-life of iodine radioisotope permits application without risk of product contamination . . .**

product shipped and stored as  $\text{Te}^{132}$  parent holds activity for 2-8 weeks

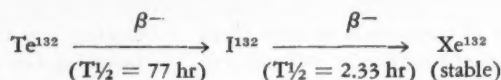
**Uses:** Radioactive isotope is ideal for tracer work. For example, it could be added at one point in a chemical process and its distribution or location in subsequent steps could be readily detected and followed. Locations of pipes buried in trenches, floors, walls, and underground could be spotted easily.

**Features:** Radioisotope has short half-life and emits hard penetrating gamma rays. Short half-life means that a large enough quantity to be easily detected could be added without risk of having finished product radioactive, as after 24 hr less than one-thousandth of original starting material remains in the process.

Another advantage of short half-life is that it permits repeat tests or experiments to be made on a given system in a much shorter time. Third, in some cases it may permit massive doses of radiation to be administered without deleterious effects caused by lingering whole body radiation.

Due to the fact that parent material of the isotope is supplied, it can be shipped and used all over the country in quantities which will last from two to eight weeks, depending upon user's particular requirements. Shipping assembly is self-contained.

**Description:** Iodine-132 has a half-life of 2.33 hr, is supplied as parent material, tellurium-132, which decays according to following equation:



Iodine-132 emits beta particles which are considerably harder than  $\text{I}^{131}$ .

Since  $\text{I}^{132}$  has a shorter half-life than its parent, it quickly reaches "transient equilibrium." At this point it decays with an "effective" half-life equal to that of the parent. Therefore, shipment is made in the form of radioactive  $\text{TeO}_2$ , which has been separated from irradiated uranium and other fission products. Possibility of contamination by a spilled liquid is eliminated.

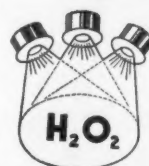
The solid state traps and holds  $\text{I}^{132}$  which is constantly growing in. A simple "milking" process has been worked out enabling user to make separation at will. Three standard size shipments are made: 10 mc, 100 mc, and 1000 mc. Because of production methods, as much as ten days notice may be required before shipment.

( $\text{I}^{132}$  is available from Hot Laboratory Operations Div., Brookhaven National Laboratory, Associated Universities, Inc., Upton, Long Island, N.Y. . . . or check CP 5536 opposite last page.)

# Xtracts

USEFUL INFORMATION ABOUT REACTIVE CHEMICALS  
FROM THE DU PONT ELECTROCHEMICALS DEPARTMENT.

## Single-Stage Epoxidation with Hydrogen Peroxide



Epoxidation conversion of natural fats and oils to a variety of useful derivatives has been simplified by a new method recently developed by Du Pont. Through

use of cation exchange resins, hydrogen peroxide is made more reactive. In a one-step reaction, per acid is formed *in situ* and used in the presence of the material to be epoxidized. Efficiency is high for practically all of the  $\text{H}_2\text{O}_2$  is converted easily to the highly reactive per acid.

Other advantages for the new resin technique include higher epoxy content; lower by-product formation; easy adaptation to give desired type of product; lower material cost; easier recovery of epoxidized oils; safer operation.

For more details, send for Bulletin P 61-454.

## Tetrahydrofuran (THF)—Powerful Solvent for Vinyl Polymers

Here's a most powerful solvent for the difficultly soluble organic materials and resins, particularly the hard-to-dissolve polyvinyl chlorides and vinylidene chloride copolymers. THF dissolves these high molecular weight materials at room temperature—producing solutions that combine high solids content with practical working viscosities. The superior solvent power of THF has made possible the production of improved compositions for plastic adhesives, printing inks and lacquers used in topcoating plastic sheeting.

A colorless liquid, THF is miscible with water, ketones and most of the common organic solvents. Mixtures of THF and these other solvents frequently exhibit greater solvent

action than either solvent alone (synergism).

Its ether structure and ability to dissolve many organics make THF an excellent solvent medium for Grignard, lithium aluminum hydride, sodium acetylide, and other reactions.

For more information about THF, just check and send coupon at right.

## Try "Elvacet" to Solve a Binder Problem



"Elvacet" polyvinyl acetate resin emulsions can solve many binder problems where high strength and stability are im-

portant factors . . . where costs must be held to a minimum. "Elvacet" binders feature excellent film-forming and thermoplastic adhesive properties. They are stable to light and oxidation . . . are resistant to water, oils and aliphatic hydrocarbons . . . and exhibit excellent aging characteristics.

Strong, durable sheets, containers and other objects can be made from a wide variety of materials, including wood flour, leather scrap, asbestos, ground cork, textile fibers, clay, sand and plaster of Paris . . . "Elvacet" binders for non-woven fabrics do not discolor or lose bonding strength in sunlight, atmosphere or during shelf storage . . . "Elvacet" emulsions, modified with fillers or plasticizers, produce stable and highly adhesive mastics, leveling compounds and joint compounds for ceramic and plastic tile, linoleum, metal, wood and cork.

"Elvacet" is an easy to handle, high solids content, water emulsion. It can be used "as is" or readily diluted, thickened, plasticized or otherwise compounded to give special properties.

For more information about profitable uses for "Elvacet", in textile finishes, water-based paints, and binders—just check the coupon.

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## NaCN—Industrial Veteran Keeps Up with the Times

No newcomer to industry, sodium cyanide is becoming increasingly important in the field of organic synthesis.



The Strecker amino acid synthesis is based on the reaction of ammonia with cyanohydrins—which are formed by the reaction of sodium cyanide with aldehydes and ketones. By this method, alpha-aminopropionic acid can be prepared from acetaldehyde, aminoacetic acid (glycine) from formaldehyde and alpha-amino isobutyric acid from acetone.

The cyanohydrins formed by the reaction of aldehydes and ketones with sodium cyanide can be converted to the corresponding organic acids or esters. Acetaldehyde cyanohydrin, for example, yields alpha-hydroxy propionic acid (lactic acid), while the cyanohydrin of methyl ethyl ketone gives alpha-methyl butyric acid.

High purity sodium cyanide is available from Du Pont in egg, flake and granular form.

## Formaldehyde—The Chemical Button

Formaldehyde is one of the most reactive organic chemicals. It reacts with a wide variety of organic and inorganic compounds to make many interesting and useful derivatives. It takes part in many reduction, addition, condensation, and polymerization reactions. Its methylene ( $-CH_2-$ ) group functions as a "chemical button" to link similar or dissimilar molecules.

High purity 50% and 37% formaldehyde is available at low cost from Du Pont. For more information about its properties, just check the coupon.

E. I. du Pont de Nemours & Co. (Inc.)  
11507 Nemours Bldg., Wilmington, Del.

Please send me literature and information on:

- ☐ Tetrahydrofuran
- ☐ "Elvacet" polyvinyl acetate
- ☐ Epoxidation with  $H_2O_2$
- ☐ Formaldehyde
- ☐ Dimethyl Hydantoin
- ☐ DMH-F resin
- ☐ MDMH

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

## New Products

### Dimethyl Hydantoin-Formaldehyde Resin (DMHF)

Low molecular weight polymer

Readily soluble in water and in a number of common organic solvents. Solutions have low viscosity even at high solids content. Compatible with a variety of plasticizers, extenders and resins. Forms films which can be insolubilized to a high degree.

Useful in textile sizes, paper coatings and adhesives.

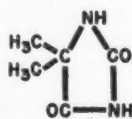
Write for Bulletin No. 26

### Dimethyl Hydantoin (DMH)

White, crystalline solid

Typical Reactions:

Substitutions can be made in the imino and carbonyl groups; fission of the ring is possible with mineral acids and dilute alkaline solutions; mono- and di-N-halogen derivatives are obtained by halogenation.



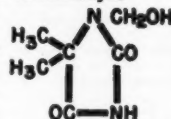
Send for Bulletin No. 23

### Monomethylol Dimethyl Hydantoin (MDMH)

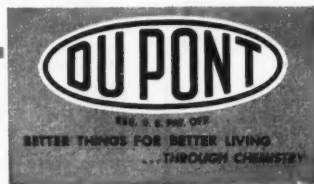
Odorless donor of formaldehyde

Contains 19% combined formaldehyde; acts as odorless donor of formaldehyde which is released under alkaline conditions.

Acts as protein hardener in the production of water-resistant coatings and adhesives; has preservative and antiseptic properties; is useful in the formulation of embalming fluids.



Check Coupon for Bulletin No. 30



No pick and shovel needed . . .

when you see the featured Materials section in April CHEMICAL PROCESSING. With a minimum of 'digging', you'll find a goldmine of information, including a listing of new chemical materials and a "use-index" to help you find what you want in a hurry.

## MATERIALS

Shows promise as an ingredient in production of heat-resistant epoxy and phenolic resins . . .

dihydroxy diphenyl sulfone also used in organic synthesis as an intermediate

Uses: Chemical shows promise as an ingredient in production of heat-resistant epoxy and phenolic resins. It is used in organic synthesis as an intermediate. Other applications include as an electroplating bath additive, stabilizer for cellulose materials, in adhesive formulations, as a buffer, and as a biocide.

Features: Compound is of value in those applications in which a phenolic compound stable to oxidizing action of light and air is required. Chemical reactions are those of phenol modified by presence of sulfonyl group.

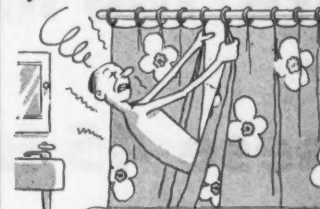
Description: Dihydroxy diphenyl sulfone,  $C_{12}H_{10}O_4S$ , assays 69-79% 4,4' isomer and 31-21% of the 2,4' isomer. Phenol runs less than 0.05%; moisture content, less than 0.5%. Particle size is 3% (max) retained on 6-mesh screen.

Experimental feeding tests indicate compound is practically nontoxic from the acute oral point of view. Approximate lethal dose is 10.0 gm/kg for rats and 7.0 gm/kg for rabbits. Material may be very mildly irritating to normal skin, and should be washed off immediately if there is accidental skin contact.

(Dihydroxy Diphenyl Sulfone (DDS) is a product of Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 12th and Delmar, St. Louis 4, Mo. . . or for more information check CP 5538 on handy form opposite last page.)

MAIL COUPON BELOW

The BETTER the ODOR the BIGGER the SALES!



REMEMBER WHEN . . .

. . . those newly purchased plastic shower curtains filled the air with an almost sickening scent? . . . when your freshly painted interiors reeked of irritating thinners and solvents? . . . when to enjoy the ease and comfort of foam rubber cushioning one had to endure its characteristic unpleasant odor? Today these objections are seldom encountered. Inherently bad product odors have been eliminated either by the use of more highly purified raw materials, by refinements in processing, or by the use of skillfully composed aromatic masking agents. Since its earliest applications, our firm has made important contributions to the science of industrial odor control. On the basis of that experience, we invite your inquiries for assistance.

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We are interested in ☐ PERFUMES  
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☐ ADHESIVES ☐ FINISHES ☐ INK  
☐ LEATHER ☐ PAINT ☐ PLASTICS  
☐ PETROLEUM PRODUCTS  
☐ POLISHES ☐ RUBBER ☐ SOLVENTS  
☐ SPRAYS ☐ TEXTILE CHEMICALS  
☐ OTHERS: \_\_\_\_\_

(Note: Please send accompanying letter giving details of your particular problem.)

COMPANY: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_  
CITY: \_\_\_\_\_ STATE: \_\_\_\_\_  
ATTENTION: \_\_\_\_\_  
TITLE: \_\_\_\_\_

**FRITZSCHE**  
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When inquiring check CP 5539 opposite last page

When inquiring check CP 5537 opposite last page

# Are You in one of these 45 Industries that use High Purity



## Crystal Urea?

(CARBAMIDE)

Purity of raw materials is always important for quality control of final products. It is especially valuable when you can get these high purity materials for your special uses!

Nitrogen Division Crystal Urea is made to meet rigid specifications . . . and at no extra cost to you.

Nitrogen Division Crystal Urea is made synthetically at two modern plants. It is always of the same high quality.

**Fast Delivery Is Assured!** Carlot and trucklot shipments are made directly from stocks maintained at new producing plants in Ironton, Ohio, and Omaha, Nebraska. LCL from warehouse stocks at Passaic, New Jersey; Chicago, Illinois; Providence, Rhode Island; East St. Louis, Illinois; Charlotte, North Carolina.

Nitrogen Division Crystal Urea is packed in 100-lb. moisture-proof, multi-wall paper bags.

Anhydrous Ammonia • Ammonium Sulfate • Methanol  
Ammonia Liquor • Sodium Nitrate • Ethanolamines  
Ethylene Oxide • Ethylene Glycol • Diethylene Glycol  
Urea • U.F. Concentrate-85 • Nitrogen Tetroxide  
Nitrogen Solutions • Fertilizers & Feed Supplements  
Formaldehyde

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Disinfectant  
Distilled Liquor  
Dye  
Electrical  
Explosives  
Fats & Oils  
Fermentation  
Fertilizer  
Finishes  
Firefighting  
Food  
Glue & Gelatin  
Inks  
Insecticides  
Leather  
Matches  
Medicine  
Metallurgy  
Oral Hygiene  
Paint & Varnish  
Paper  
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Photography  
Plastics  
Refrigeration  
Resins  
Rubber  
Soap  
Textile  
Wine  
Wood

## U. F. Concentrate - 85!

Highest Concentration Liquid Formaldehyde Available commercially—59% Formaldehyde, 26% pure Urea in water solution.

Costly excess water has been squeezed out. High costs too have been squeezed out. It increases productive capacity by increasing the effective charge and decreasing cycle time. Send for informative booklet!

## MATERIALS

### Covers styrene/butadiene latexes for use in paint applications

Use of styrene/butadiene latex paints as interior coatings has familiarized users with their many advantages, and has directed interest in obtaining latex paints for other uses. Twenty-page technical bulletin supplies information on texture paints, primer-sealers, and exterior masonry paints based on styrene/butadiene latexes.

"Styrene/Butadiene Latexes for Latex Paints" is issued by Plastics Dept., The Dow Chemical Co., 1000 Main St., Midland, Mich. When inquiring check 5541 on handy form opposite last page.

### Tests show that inherently flexible vinyl copolymer emulsions give best binding characteristics . . .

pigment-binder systems made on lab scale, films tested on Gardner scrub machine

In order to determine critical pigment volume concentrations of polyvinyl acetate and vinyl copolymer dispersions, scrub tests were made on dried films of various resin binders and film-former additives.

Conclusions drawn by the researcher were:

- 1 — Inherently flexible vinyl copolymer emulsion (also referred to as internally-plasticized emulsion) give best binding characteristics, because of its inherently better film-forming properties.
- 2 — Film-fusion additives which are fugitive (for example, hexylene glycol) significantly improve binding properties.
- 3 — With straight polyvinyl acetate, addition of plasticizer and film-fusion additive does increase binding power, but values obtained are lower than those with inherently flexible emulsions.

For the tests, simple pigment-binder systems were made on lab scale, and films were cast on frosted glass the same day. A 0.003" Bird Film Applicator was used. After drying 24 hours at room temp, films were tested with a Lava soap solution on a Gardner Straight Line Washability and Abrasion Machine. It was presumed that the breaking point in the scrubability curve indicated maximum pigment loading tolerance of resin. Addition of more pigment rapidly diminished film properties. The inherently flexible vinyl copolymer emulsion used for tests was National Resyn 12K51.

(Taken from technical paper by H. A. Conrad, New Products Development, Resin Div., National Starch Products Inc., Dept. CP, 268 Madison Ave., New York 16, N. Y.)

**Gains 6-13 points of brightness  
in bleaching groundwood  
for paper making . . .**

sequestering agent controls iron contamination

**Uses:** As a reducing agent for bleaching groundwood pulp. It has also been used for bleaching clay, stripping dyed fabrics, and as an aid in separation and classification of minerals in ore flotation.

**Features:** Material supplies paper makers with a gain of 6 to 13 points of brightness at a very nominal cost. Conditions of bleaching can be varied to meet particular requirements of mills; for example, useful temperature range is from 90° to about 160°F. At each temperature, a certain brightness level and speed of bleaching are attained. Effects of iron contamination are controlled by sequestering agents.

**Description:** Zinc hydrosulfite is a stable, free-flowing, high strength, white powder. For best results, 3 to 5% pulp is bleached with a 1% zinc hydrosulfite (based on dry weight of pulp) to which 0.5% sodium tripolyphosphate has been added, for 1/2-1 hour at 140-160°F. Final mixture should have adjusted pH of 5-6.5. One to two points of additional brightness are obtained by use of the polyphosphate. Reversion losses are essentially eliminated.

Usually this bleaching process can be put into the mill with little or no changes or additions in equipment. A stock pump and some retention tanks are all that is required.

(Zinc hydrosulfite is a product of Virginia Smelting Co., Dept. CP, West Norfolk, Va. . . . or for more information concerning manufacturer's product, reader may simply check CP 5542 on handy form opposite last page.)

**Presents information regarding  
the use of safflower oil**

Eighty-page monograph on safflower oil and its processed varieties presents a compilation of the more pertinent and recent data available. First section of 45 pages covers properties of the oil, its processed and modified varieties, and processes by which these oils and modified oil products are made. Second section is concerned with use of the oil products in pigmented finishes. Basic properties and reactions of safflower oil and its processed varieties with various pigments, types of pigmentations and additives are discussed.

"Safflower Oil" is issued by Pacific Vegetable Oil Corp., Dept. CP, 62 Townsend St., San Francisco 7, Calif. When inquiring reader may specify CP 5543 on Reader Service slip which is located opposite last page.



Just imagine soup concentrate in a packet that's soluble, odorless, tasteless, nontoxic.

Think of other package uses: Powdered soap or detergents, sugar, puddings and desserts, pharmaceuticals.

—or any product added to water in fixed amounts.

They're all possible with new edible films that are derived from Glycerine or using Glycerine as a plasticizer.

The unique balance of properties that won such wide acceptance for Glycerine in the past continues to open new doors to chemical progress. In paints, foods, pharmaceuticals, packaging . . . for tomorrow's surge of new specialties . . . in formulations and reactions yet unknown. Nothing takes the place of Glycerine.

This balanced group of properties keeps **Glycerine's** usefulness growing

HYGROSCOPICITY • STABILITY •  
SOLVENT POWER • VISCOSITY • NONVOLATILITY •  
NONTOXICITY • TASTE • MW/HYDROXYL RATIO •

HUMECTANT •  
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EMOLLIENT • ANTI-FREEZE • ALKYD BASE •

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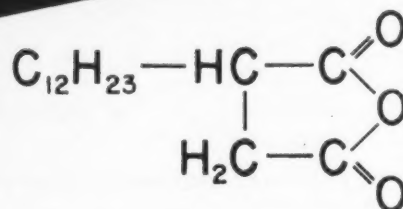
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When inquiring check CP 5544 opposite last page

*Now Available*  
*from the principal producer of Succinic Compounds*  
*an interesting alkenylsuccinic anhydride*

# DODECENYLSUCCINIC ANHYDRIDE



Appearance: Light yellow, clear, viscous oil. Molecular Weight: 266 (calculated). Neutral Equivalent: 131-137. Viscosity: See Figure 2. Specific Gravity:  $d_{25}^4$  1.002. Flash Point: 178° C (Cleveland open cup). Boiling Point: 180-182° C at 5 mm. Hg. Infra-red Spectrum: See Figure 1.

The unusual molecular structure of this bifunctional alkenylsuccinic anhydride, reacting as an unsaturated compound and an acid anhydride, should interest all who work with

- ✓ Alkyd Resins
- ✓ Polyester Resins
- ✓ Plasticizers and Extenders for Resins, Rubber, Paints, Varnishes and Enamels
- ✓ Synthetic Lubricants
- ✓ Lube-Oil Additives
- ✓ Corrosion Preventives for Gasoline, Oils, Waxes, Paints and Varnishes
- ✓ etc., etc., etc.

National Dodecenylsuccinic Anhydride is one more reactive chemical intermediate resulting from National Aniline Research on dicarboxylic anhydrides and related organics. National has ample basic production and many years experience in Succinic Compounds. We invite inquiries from those whose work may lead to substantial additional use.

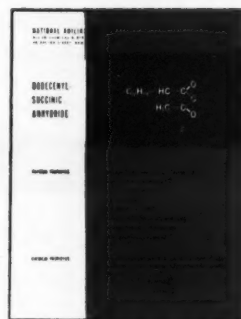
**NATIONAL ANILINE DIVISION**  
**ALLIED CHEMICAL & DYE CORPORATION**  
**40 RECTOR STREET, NEW YORK 6, N. Y.**

Boston Providence Philadelphia Chicago San Francisco  
 Portland, Ore. Greensboro Charlotte Richmond Atlanta  
 Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto



## WRITE FOR TECHNICAL BULLETIN I-8

This 6-page bulletin gives physical properties, chemical reactions, suggested uses and literature references.



## MATERIALS

### Imparts viscosity stability to DOP-plasticized vinyl plastisols

**Uses:** As a low-cost extender plasticizer for vinyl chloride.

**Features:** Material imparts excellent viscosity stability to dioctyl phthalate (DOP)-plasticized vinyl plastisols. Initial viscosity buildup after 4 hr @ 25°C was reduced from 3220 to 2060 cp by replacing 25% of plasticizer system with this material, called HB-20. After 21 days the viscosity of the HB-20 and DOP formulation had increased to 4900 cp, while that of the straight DOP rose to 9400 cp.

At 40°C the 4-hr and 21-day viscosities for the modified plastisols were 1820 and 6220 cp. Corresponding readings for the unmodified DOP material were 3000 and 47,900 cp. At 50°C the DOP plastisol gelled after one day, while the modified material did not gel until the 14th day.

**Description:** Extender plasticizer HB-20 is a partially hydrogenated alkyl-aryl hydrocarbon, recommended for use in dark-colored products. Primary physical properties are as follows:

|                                  |                                    |
|----------------------------------|------------------------------------|
| <b>Appearance</b>                | Practically colorless, oily liquid |
| <b>Color (APHA)</b>              | Less than 100                      |
| <b>Odor</b>                      | Faint, pleasant                    |
| <b>Sp Gr (@ 25/15.5°C)</b>       | 0.971 ± 0.003                      |
| <b>Refractive Index (@ 25°C)</b> | 1.5470                             |
| <b>Viscosity (SSU @ 100°F)</b>   | 55.7                               |
| <b>Pour Point (°C)</b>           | -54                                |
| <b>Flash Point (°C)</b>          | 160                                |
| <b>Flame Point (°C)</b>          | 182                                |
| <b>Aniline Point (°C)</b>        | -15                                |

(Extender plasticizer for vinyl chloride is a product of Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. . . or check CP 5546 opposite last page.)

### Answers questions about fibers made from Teflon

Teflon fiber offers possibility of obtaining new end-use applications as well as unheard-of performance in existing fiber applications of industrial nature, because of its remarkable combination of physical and chemical properties. Technical bulletin of 19 pages presents strength and thermal data of the fiber, and answers such questions as: Can fabrics be stabilized under tension? What is the processability of Teflon fiber? What are recommended procedures for finishing fabrics for high temperature environmental use?

Teflon Bul No. 2 is issued by Textile Fibers Dept., E. I. du Pont de Nemours & Co., Inc., Dept. CP, Wilmington 98, Del. When inquiring specify CP 5547 on handy form opposite last page.

When inquiring check CP 5545 opposite last page

**Reasonably-high-purity  
of myrcene suggests  
more applications**

**Uses:** Presently used in manufacture of perfume and industrial aromatics, synthetic rubber, and related synthetic elastomers, compound is highly adaptable for synthesis of aromatic-type materials and a general line of chemicals and plastics.

**Features:** Combining reasonably-high purity with an attractive price structure, compound suggests a wide variety of additional applications. Product will readily polymerize in emulsion with peroxide catalysts to produce a rubber-like latex. It will also copolymerize with styrene, methyl styrene, ethyl acrylate, and acrylonitrile, and it can be hydrated to yield alcohols similar to linalool.

**Description:** Myrcene-85 is a highly refined grade of the material, running 75% myrcene. Balance is primarily 1-limonene together with the chemical's polymers and small quantities of unreacted  $\beta$ -pinene.

(Myrcene is a product of Naval Stores Div., The Glidden Co., Dept. CP, PO Box 389, Jacksonville 1, Fla. . . . or for more information check CP 5548 on handy form opposite last page.)

**Aromatic chemicals,  
essential oils**

Catalog and price list of essential oils, aromatic chemicals, oleoresins, balsams, and gums is available to those who buy in wholesale quantities.

List is issued by Fritzsche Bros., Inc., Dept. CP, 76 Ninth Ave., New York 11, N.Y. When inquiring specify CP 5549 on handy form opposite last page.

For more information on product at right, specify CP 5550 . . . see information request blank opposite last page.



**FAMOUS LIGHTHOUSES OF AMERICA**



*Boston Light, America's first lighthouse, was built in 1716 at the north side of the entrance to the main ship channel in Boston Harbor. The scene of several bitter contests for possession during the Revolutionary War, it was destroyed by the British in 1776. A new tower for this famous light was built in 1783 and is still in use today.*

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60 East 42nd Street, New York 17, N. Y.



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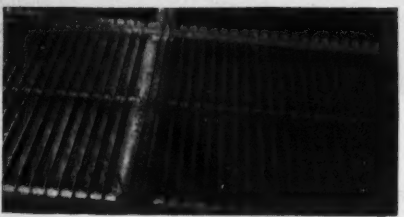
PERTH AMBOY, NEW JERSEY—Asphaltic Products



BROOKLYN, N. Y.—Stearates, Vinyl Stabilizers



WESTLAKE, LOUISIANA—Furnace Black

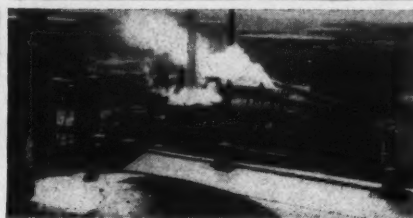


EUNICE, NEW MEXICO—Channel Black



PONCA CITY, OKLAHOMA—Furnace Blacks

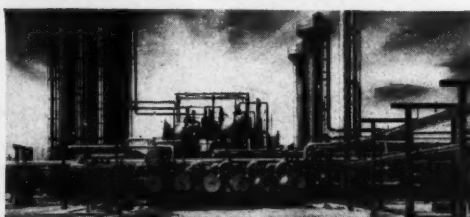
# Superior Chemicals from 10 Witco Plants



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LOS ANGELES, CALIF.—Driers, Organic Chemicals



WITCO, TEXAS—Channel Black, Hydrocarbons

Ten Witco plants, located in key areas across the country, are fully equipped to serve you quickly and effectively with chemicals of the highest quality. And to see that every Witco product performs with top efficiency, Witco's technical service experts offer on-the-spot help to assist you with your product or processing problem.

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## WITCO CHEMICAL COMPANY

240 Madison Avenue, New York 16, New York  
Los Angeles, Boston, Chicago, Houston, Cleveland, San Francisco, Akron, Atlanta, London and Manchester, England.

## MATERIALS

### Ready-to-use powders produce low-density foam structure

**Uses:** As electrical or thermal insulation, core materials, radomes.

**Features:** Ready-to-use powders produce low-density silicone foam structures that are heat-stable, non-flammable, and resistant to thermal shock. Foaming materials require no additional mixing, catalyst, or other components. They are non-toxic and produce no hazardous gases.

**Description:** Three separate mixes — R-7001, R-7002, R-7003 — are available. Each is a dry, granular powder that is ready-to-use. The mixes melt, foam, and cure themselves when heated. Density can be controlled from 8 to 18 lb/cu ft by varying expansion temperatures.

Finished foams are characterized by a uniform, spherical, unicellular pattern. All remain stable at as high as 700°F. They exhibit good physical and electrical properties, low moisture absorption and thermal insulating values in the range of 0.3 Btu/hr/sq ft/°F/ft.

(Expansive resins for silicone foam structures are products of Dow Corning Corp., Dept. CP, Midland, Mich. Check CP 5551 opposite last page.)

### C<sup>14</sup>-tagged mannose now available

Commercially available for the first time is C<sup>14</sup>-mannose. Compound has high-level activity of approximately 2  $\mu$ c/mg and low specific activity of up to 1  $\mu$ c/mg.

(C<sup>14</sup>-mannose is product of Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mount Vernon, N.Y. Check CP 5552 on handy form opposite last page.)

For more information on product at left, specify CP 5553 . . . see information request blank opposite last page.

## MATERIALS

### Low volatility, greater stability, good low-temp characteristics in vinyl insulation . . .

di-decyl phthalate plasticizer is especially good in high-temp applications

**Uses:** As a plasticizer in vinyl high temperature wire insulation compounds.

**Features:** With the lowest volatility of any primary monomeric ester commercially available as a vinyl resin plasticizer, compound also has greater stability than TCP, with no discoloration during processing and less yellowing and practically no tack after exposure to UV light. Low temperature characteristics are equivalent to DOP, with water extraction lower.

**Description:** Cabflex® DDP, di-decyl phthalate, can be used in the following formulation:

|                                |           |
|--------------------------------|-----------|
| Vinyl resin (electrical grade) | 100 parts |
| Cabflex DDP                    | 38        |
| TCP                            | 20        |
| #33 Clay                       | 5         |
| Dythal                         | 6         |
| Paraffin                       | 0.5       |

Test results reported below were obtained on wire produced during a factory run with above formulation. (Tests run on #18 wire, 1/32" wall thickness.)

|  | Suggested<br>Formulation | Control<br>(All TCP) |
|--|--------------------------|----------------------|
| Insulation resistance (megohms/<br>1000 ft @ 50°C)         |                          |                      |
| 1 day  | 17.9                     | 1.97                 |
| 1 week   | 26.0                     | 0.80                 |
| 3 weeks  | 69.0                     | 1.20                 |
| 9 weeks  | 31.0                     | 0.71                 |
| Low temperature properties<br>(bent around 0.113" mandrel) |                          |                      |
| Passed (°F)  | -20                      | -10                  |
| Failed (°F)  | -30                      | -20                  |
| Retention of elongation<br>(7 days @ 113°C, %)             | 89                       | 83                   |

(DDP is a product of Plastics Chemicals Div., Godfrey L. Cabot, Inc., Dept. CP, 77 Franklin St., Boston, Mass. . . or for more information check CP 5554 opposite last page.)

### Carbon black dispersions for paint formulators

Carbon black dispersions for paint formulators is subject of eight-page digest-size bulletin. Dispersions of Black Shield general utility blacks, pure alkyd blacks, blacks for nitrocellulose lacquers, vinyl blacks, lampblack dispersions are covered.

"Let CD Do Your Dirty Work" is issued by Carbon Dispersions, Inc., Dept. CP, 27 Haynes Ave., Newark 5, N.J. When inquiring specify CP 5555 on handy form opposite last page.

Consistent  
High Purity

Ethylene Oxide

There is no requirement set by industry that Nitrogen Division high purity Ethylene Oxide cannot meet or beat.

For your special problems call upon Nitrogen Division technical service. A staff of trained, experienced engineers is available to assist you.

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Ethylene Glycols  
Formaldehyde  
Nitrogen Tetroxide  
Nitrogen Solutions  
U.F. Concentrate-85  
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When inquiring check CP 5556 opposite last page

Heyden

# Salicylic Acid

by the truckload...

by the drum...



in the right form

to fit your needs...



## U.S.P. CRYSTALS

A product of extremely high purity. Valued as an intermediate for the manufacture of aspirin and salicylates.



## U.S.P. POWDER

Used in dusting powders, lotions and ointments for its antiseptic, fungicidal and keratolytic properties.



## TECHNICAL CRYSTALS

An exceptionally pure technical sublimed product used in rubber and as a chemical intermediate for dyes and essential oils.



## H POWDER

An economical unsublimed grade suitable for use in organic syntheses, rubber, and other technical applications.

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## Heyden Salicylates

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**POTASSIUM SALICYLATE**  
Powder

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**PHENYL SALICYLATE N.F.**  
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Phenylacetylenes • Phenylhydrazine • Propyl Chloride • Resorcinol • Salicylates • Salicylic Acid • Sodium Peroxide

## MATERIALS

### Undergoes reactions of hydroxyl group and benzene ring

**Uses:** As a chemical intermediate. Compound should also find application as an effective bactericide and preservative.

**Features:** Chemical undergoes normal reactions of the phenolic hydroxyl group and nuclear substitution of the benzene ring. Reactions should proceed under similar conditions and in approximately equivalent yields as octylphenol.

**Description:** Nonylphenol, a clear, straw-colored liquid, is 92-95% the para-isomer, balance being ortho. Side chain is mixture of branched chain isomers. Specifications include:



**Nonylphenol**

|   |          |
|---|----------|
| Sp gr (30/4°C)                            | 0.93-.95 |
| Hydroxyl number                           | 240-255  |
| Color (APHA, max)                         | 200      |
| Distillation range (°C @ 15 mm, 90 % min) | 155-195  |

Compound is practically insoluble in water, and is quite soluble in common organic solvents.

(Nonylphenol is a product of Special Products Dept., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. . . or for more information check CP 5557 opposite last page.)

### Offers tagged glucose, fructose, starch, and sucrose

Uniformly-labeled glucose, fructose, starch, and sucrose—tagged with C<sup>14</sup>—are available from stock. They are supplied in crystalline powder form by Tracerlab Inc., Dept. CP, 130 High St., Boston 10, Mass. Check CP 5558 on handy form opposite last page.



For more information on product at left, specify CP 5559 . . . see information request blank opposite last page.

When glucose soluble

Uses: established for the neuritic

Features: numerous drugs, toxicology of toxic exam acid which and

Description: as a ing p

Results: that when itself injected (Glucose) Com New check

Offers of aluminum

Processes: acids with achieving action inst For or or factu Beve retur

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MAR C

## MATERIALS

**When combined with various drugs, glucuronolactone may alter toxicity, solubility, rate of absorption . . .**

forms water-soluble salts with most metal ions

**Uses:** In pharmaceutical field as a modifier for established drugs. Its use alone has been suggested for treatment of various diseases such as arthritis, neuritis, and allergies.

**Features:** Ability to combine chemically with numerous physiologically-active compounds and drugs offers possibility of altering their characteristics beneficially, particularly from the standpoints of toxicity, solubility, and rate of absorption. For example, compound combines with isonicotinic acid hydrazide (INH) to form a hydrazone (INHG) which is reported to be equally as effective as INH and considerably less toxic.

**Description:** Argo glucuronolactone is available as a fine, white crystalline powder with the following physical characteristics:

|   |      |
|---|------|
| Melting point (°C)                          | 172  |
| Sp gr (30/4°C)                              | 1.76 |
| pH (initial in 10% aq. soln.)               | 3.5  |
| Specific rotation $\alpha_D^{20}$ in water) | +20° |
| Odor  | None |

Results of radioactive tracer experiments indicate that salts of the acid are most effectively utilized when administered by injection, while the acid itself is utilized whether administered orally or by injection.

(Glucuronolactone is a product of Chemical Div., Corn Products Sales Co., Dept. 17, Battery Pl., New York 4, N. Y. . . . or for more information check CP 5560 on handy form opposite last page.)

### **Offers custom service for reduction of organic compounds with lithium aluminum hydride . . .**

method gives high yields without the danger of side reactions

Processes requiring safe, fast reductions of organic acids, esters, ketones, aldehydes, or acid chlorides, with or without hydrogenation of double bonds, achieve higher yields without danger of side reactions with lithium aluminum hydride, in many instances.

For the company not wishing to tie up equipment or one technically unfamiliar with hydrides, manufacturer offers a custom reduction service at his Beverly, Massachusetts plant. Reduced material is returned to companies for further processing.

(Custom hydride reduction is a service of Metal Hydrides, Inc., Dept. CP, 12-24 Congress St., Beverly, Mass. . . . or for more information check CP 5561 on handy form opposite last page.)

*"Don't worry—*

## **It's Thixotropic!"**

The paint that didn't spill for the young lady represents a remarkable new development in the nation's paint industry. It's manufactured from "Burnok," a new thixotropic alkyd developed by the T. F. Washburn Company, Chicago, Ill.

Paints made of Burnok alkyds solve many age-old painting problems. Because they have a thick, jelly-like consistency, they won't settle, never have to be stirred, and won't sag, curtain, or bead. They are ready for use as soon as opened. But despite this thick consistency, paints containing Burnok vehicles brush on as easily as ordinary paints.

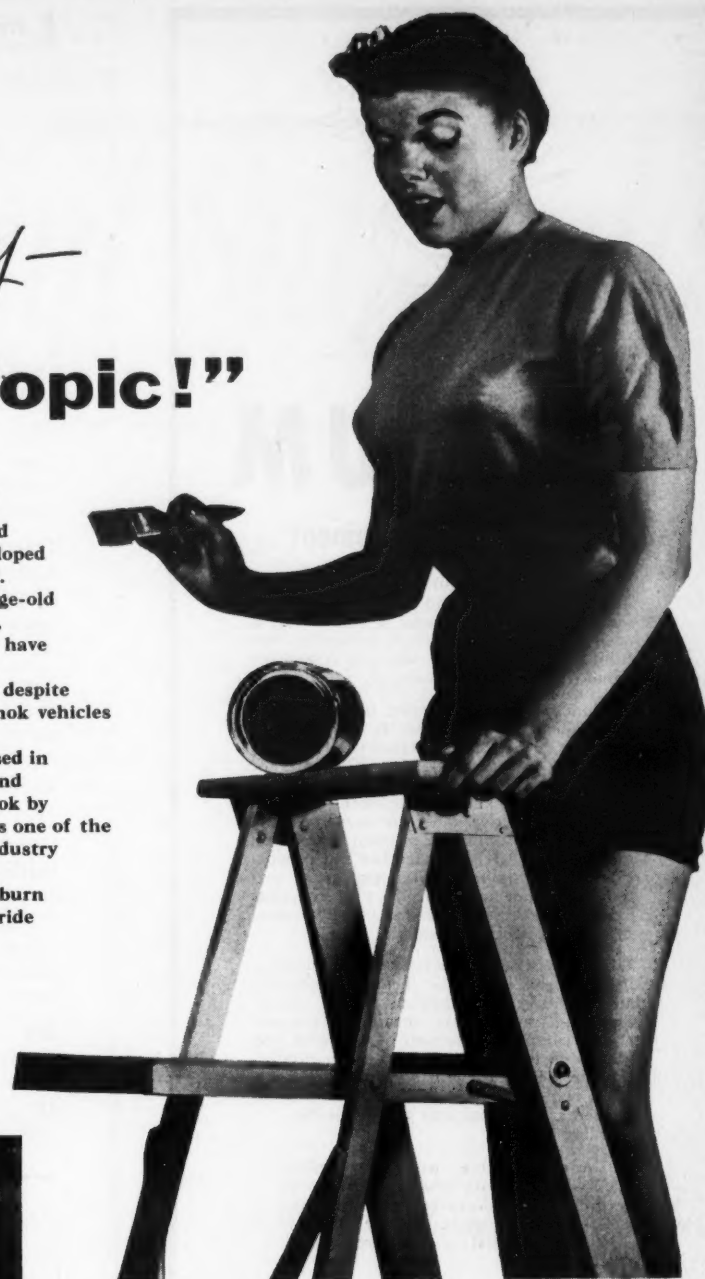
Today, this revolutionary vehicle is being used in all types of oil base paints—flats, semi-gloss and high gloss enamels. The development of Burnok by the T. F. Washburn Company is recognized as one of the most significant contributions to the paint industry in recent years.

In the production of Burnok vehicles, Washburn regularly employs Pittsburgh Phthalic Anhydride because of its uniform high quality.

As a basic producer of Phthalic Anhydride, Pittsburgh can assure you consistent quality, dependable supplies and fast deliveries. Call or write for full information today.



In the production of Burnok alkyd vehicles by a controlled reaction in stainless steel kettles, high purity Pittsburgh Phthalic Anhydride is one of the key materials.



COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

When inquiring check CP 5562 opposite last page



# LITHIUM

## ... the Miracle Element

Lithium may hold for you the clue to a new or better process in *your* industry. Lithium anticipates the future: it awaits only a need—perhaps yours—for its properties. For lithium properties are unusual, sometimes paradoxical, and often uniquely valuable.

Lithium metal, for example, is lighter than magnesium or aluminum. It is extremely reactive, ductile, easily extruded and rolled, and readily melted or cast. The salts of lithium have low melting points. Analogous to both alkalis and alkaline earths, they too are highly reactive and form numerous low melting eutectics. These properties are stimulating to researchers, scientists and production-engineering men alike—properties that open the door to possibilities in countless fields of process chemistry and heretofore inaccessible areas of research.

Lithium has helped solve industrial processing problems in organic chemicals, ceramics, air conditioning, petroleum greases, metallurgy, pharmaceuticals, brazing fluxes and atomic energy. It may well be just what you have been looking for to solve *your* production problem . . . with such added benefits as lower costs, improved performance, increased sales appeal and greater profits . . . accruing to *you*.

Investigate this wonder chemical. Write for Data Sheets on some 25 different products—metals, salts and special compounds. All are available in experimental or commercial quantities.

... trends ahead in industrial applications for Lithium.

**LCA LITHIUM CORPORATION OF AMERICA, INC.**

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Rend Tower, Minneapolis 2,  
Minn.

#### Mines:

Black Hills, South Dakota, Bessemer City, North Carolina, Manitoba and Quebec.

#### Plants:

St. Louis Park, Minn. and Bessemer City, North Carolina

## materials

Heat-stable, dry-blending resins provide —

## easy molding and extrusion

**Vinyl resins can be compounded  
on conventional mixing equipment**

**Uses:** As dry-blending resins for extrusion and molding applications. Separate resin is available for electrical uses.

**Features:** Resins are heat-stable and can be easily compounded on conventional mixing equipment. Similar to general purpose vinyls, these resins can usually be substituted directly in any formulation based on corresponding general purpose resins.

Since only moderate heat is necessary during blending, compounds develop only a brief heat history during mixing. This permits greater stability during the more severe conditions of forming, and, later on, during the useful life of the product. Dry blends are completely free-flowing and easy to use.

**Description:** Pliovic DB80V, DB90V and EDB90V are high grade polyvinyl chloride dry blending resins. DB80V and DB90V are intended for general purpose use, while EDB90V is designed for all electrical uses where vinyls are applicable. Physical and electrical properties are shown in table.

Dry-blending properties are primarily due to the absorption of plasticizer by the resin. Dry, free-flowing particles, exhibiting an irregular surface, encourage absorption of plasticizer. Narrow range of size distribution gives uniform absorption, yielding com-

### Typical Physical Properties of Vinyl Resins for Dry-blending

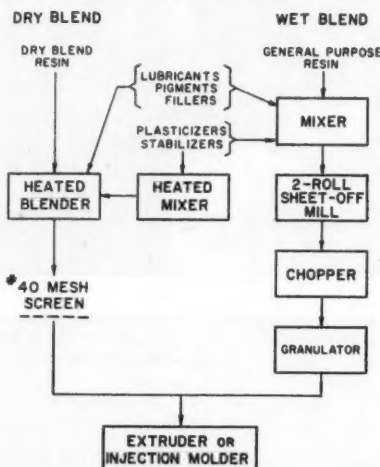
|                            | Pliovic<br>DB80V | EDB90V<br>and DB90V |
|----------------------------|------------------|---------------------|
| Particle size distribution |                  |                     |
| Through 40 mesh (%)        | 100              | 100                 |
| Through 80 mesh (%)        | 90-100           | 90-100              |
| Through 200 mesh (%)       | 0-15             | 0-20                |
| Intrinsic viscosity (avg.) | 0.80             | 0.89                |
| Sp gr (avg.)               | 1.40             | 1.40                |
| Moisture content (%)       | 0.5              | 0.5                 |
| Bulk density (lb/cu ft)    | 38               | 38                  |

### Electrical Properties of EDB90V

|   |                    |
|---|--------------------|
| Volume resistivity (ohm-cm)   | $2 \times 10^{11}$ |
| Power factor (@ $10^5$ c, $30^\circ\text{C}$ )                                  | 0.095              |
| Dielectric constant (@ $10^5$ c, $30^\circ\text{C}$ )                           | 6.7                |
| Dielectric strength (increase rate of 1400<br>v/sec, using 1" electrode, v/mil) | 500                |
| Note: Electrical properties based on compound of:                               |                    |
| Pliovic EDB90V  | 100                |
| DOP   | 50                 |
| Tribase E   | 10                 |

pounds that process efficiently.

(Dry-blending vinyls are products of Chemical Div., The Goodyear Tire & Rubber Co., Inc., Dept. CP, Akron 16, Ohio . . . or for more information check CP 5564 on handy form opposite last page.)



## dry blending

When formulations based on these compounds are prepared in a heated mixer, a dry, free-flowing mixture is obtained. This is known as a "vinyl dry blend." Blends can be handled and processed in the same equipment as that used for pelletized material. They have a decided economic advantage in that the hot-mixing, milling, and granulating process phases of compound preparation are eliminated. Ease of handling, storing, conveying, and processing are other outstanding properties of the dry blends.

Simplicity of the dry-blending operation is illustrated in this flow sheet. Not only is a higher capital investment unnecessary, but also power requirements are proportionally lower, and savings are also realized in time and handling costs.

## Plastics are not needed in suggested formulation for styrene-butadiene paint

**Serves as starting point for further laboratory work**

High stability of styrene-butadiene copolymer latices makes them easy tools for the paint manufacturer who wants to formulate latex surface coatings that develop maximum paint properties.

Butaprene paint latex does not need plasticizers to form clear, continuous films. Adhesion, flexibility, and extensibility are excellent. Heat, light, abrasion and water resistance are good. Most stains are easily removed from painted surfaces.

Formula below may be used as a starting point for further laboratory development.

|                                       | Pounds        | Gallons       |
|---------------------------------------|---------------|---------------|
| Thickener solution (13% TNV)          | 200           | 23.50         |
| Protein—10%                           |               |               |
| Preservative—3%                       |               |               |
| Dispersing agent (5% TNV)             | 46            | 5.50          |
| Stabilizer or wetting agent (25% TNV) | 3.5           | —             |
| Antifoam (60% TNV)                    | 13            | 1.50          |
| Pigments                              |               |               |
| Prime (rutile TiO <sub>2</sub> )      | 275           | 7.85          |
| Extender (clay)                       | 75            | 3.50          |
| Water                                 | 100           | 12.15         |
| Mix and add:                          |               |               |
| Water                                 | 33            | 4.00          |
| Butaprene paint latex (48% TNV)       | 350           | 42.00         |
|                                       | <u>1095.5</u> | <u>100.00</u> |

Above recipe gives a paint having pigment volume concentration of about 35%, and TNV of 50%. Weight per gal is 10.95 lb, and pH is 8.5-9.0. Stormer viscosity is 60-70 KU.

Thickener solution, the most critical part of formulation, must be prepared with utmost care, especially if natural products are used. Prime pigments impart desired color, but maximum development of hiding and tint depends upon proper dispersion. In all instances, pigments with lowest water-soluble salt content are desirable for best results.

For reasons of economy and development of specific properties, extender pigments are required. The paint latices require no modification to use in a number of applications.

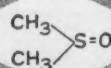
(Butaprene paint latices are products of Chemical Sales Division, Firestone Plastics Company, Division of The Firestone Tire & Rubber Company, Department CP, PO Box 690, Pottstown, Pa. . . . or for more information check CP 5565 on handy form opposite last page.)

**A BRAND NEW SOLVENT**

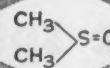
# Dimethyl Sulfoxide

*with many unusual advantages*

STEPAN



STEPAN



STEPAN

Dimethyl Sulfoxide, now available in pilot plant quantities, is a clear, water-white, very hygroscopic and completely water soluble liquid. It is believed to be non-toxic, has practically no odor, and only a slightly bitter taste. Despite being water soluble it dissolves many organic com-

pounds and is unusually selective in its solubility characteristics for hydrocarbons. Also of particular interest are the high boiling point, high flash point, and the low freezing point, (in eutectic mixtures with water) of Dimethyl Sulfoxide. Listed below are a few of its potential uses.

### Potential uses

- ◆ **Solvent for acetylene** . . . absorbs 32% more acetylene than acetone . . . 3 times longer life in acetylene cylinders.
- ◆ **Selective separation of paraffinic and aromatic hydrocarbon mixtures.** Also for desulphurization of gasolines.
- ◆ **Solvent for certain synthetic fibres** such as polyacrylonitrile and acetate rayon as well as others.
- ◆ **As anti-freeze or hydraulic fluid** when mixed with water. (Offers possible cost savings.)
- ◆ **As paint and varnish remover.** Also nail polish remover.
- ◆ **Possibly useful as diesel fuel additive.** (Raises cetane number.)

### Physical Properties

| Dimethyl Sulfoxide                               |                             |     |     |       |        |
|--|-----------------------------|-----|-----|-------|--------|
| Molecular weight                                 | 78                          |     |     |       |        |
| Melting point                                    | 18.45°C (supercools easily) |     |     |       |        |
| Boiling point (760 mm)                           | 189°C                       |     |     |       |        |
| Spec. gravity (20°C)                             | 1.100                       |     |     |       |        |
| Refractive index (n <sub>D</sub> <sup>20</sup> ) | 1.4787                      |     |     |       |        |
| Vapor pressure                                   | at                          | 20° | 30° | 47.4° | 56.6°C |
|  | mm                          | .37 | .79 | 2.82  | 5.11   |
| Viscosity 27°C                                   | 1.1 cps                     |     |     |       |        |
| Specific heat                                    | .5 cal/g as solid           |     |     |       |        |
|  | .7 cal/g as liquid          |     |     |       |        |
| Heat of vaporization                             | ca 175 cal/g                |     |     |       |        |
| Heat of solution                                 | 90 cal/g                    |     |     |       |        |
| Heat of fusion                                   | 20 cal/g                    |     |     |       |        |
| Heat of combustion                               | 6050 cal/g                  |     |     |       |        |
| Flash point (°C)                                 | 95° (open cup)              |     |     |       |        |
| Coefficient of expansion                         | .00088                      |     |     |       |        |
| Dielectric constant                              | 45                          |     |     |       |        |

Write For Complete Information

# STEPAN

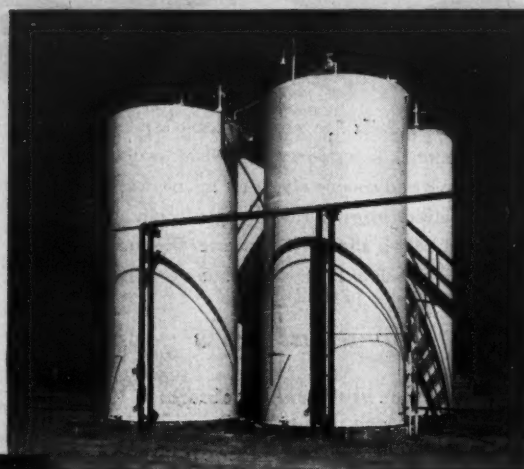
**CHEMICAL CO.**

20 North Wacker Drive, Chicago 6, Illinois  
Telephone: Central 4-5511

When inquiring check CP 5566 opposite last page

# EPON<sup>®</sup> RESIN does it!

**New paint  
lasts years  
...resists  
corrosive spillage  
at  
Diamond Alkali  
plant**



## HERE'S HOW...

PAINT LEADS a hard life at the Diamond Alkali Company agricultural chemicals plant in Houston, Texas . . . and no ordinary paint can survive there for long!

A few reasons for paint failure: Processing vessels and storage tanks are subjected to spillage of chlorinated hydrocarbons and benzene, and some also to heat. In parts of the plant, painted surfaces are exposed to the highly corrosive fumes of hydrogen chloride and sulfuric acid.

In their search to find a tougher, longer lasting paint, Diamond Alkali maintenance men tried coatings of many types, including heavy duty maintenance finishes. Some "washed

off" immediately; some lasted 6 to 8 months. Finally, Epon resin coatings based on the XA-200 formulation were tried — and found outstandingly successful.

The Epon cold-cured paint, applied by spraying throughout the entire plant, has been in service for *more than two years with no failure*. Painting costs — for both material and labor — are a mere fraction of what they formerly were, reports Diamond Alkali.

Call on our sales offices for names of suppliers who sell Epon resin coatings for your needs. Write for the full Epon coatings story in the new brochure, "Planning to Paint a Pyramid?"



### SHELL CHEMICAL CORPORATION

**Chemical Partner of  
Industry and Agriculture**

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New York 17, New York**

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**IN CANADA:**  
Chemical Division, Shell Oil  
Company of Canada, Limited  
Toronto • Montreal • Vancouver

## MATERIALS

**Excellent lightfastness, brilliance  
characterize series of organic  
color lakes . . .**

exhibit stability even in light pastel shades

**Uses:** As pigments for exterior paints and finishes requiring durability and stability of colors under severe weathering conditions.

**Features:** Exceptional lightfastness and brilliance characterize this series of organic color lakes. They are said to exhibit remarkable stability even in the very light pastel shades, in which pigments are reduced fifty to one with titanium dioxide.

**Description:** Series of color lakes, called Harmon Indo Colors, includes yellow, orange, red, scarlet, maroon, brown, green, blue, and violet. Formulations have undergone extensive exposure tests.

(Organic color lakes are developments of Harmon Colors, B. F. Goodrich Chemical Co., Dept. CP, 324 Rose Bldg., Cleveland 15, Ohio . . . or for more information check CP 5568 on handy form opposite last page.)

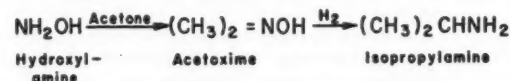
**Powerful reducing agents themselves,  
hydroxylamine salts also form many  
useful compounds . . .**

form versatile oximes with aldehydes, ketones

**Uses:** Salts are powerful reducing agents and, in addition, enter into a variety of reactions with other chemical compounds. Alone, they make ideal reducing agents in the cuprous ion method for dyeing acrylic fibers, and as reagents in analytical procedures. They are used as non-discoloring short-stoppers in production of butadiene-acrylonitrile rubber, GR-S, and other polymers.

Their derivatives find use in preparation of anti-oxidants and stabilizers, nylon-type synthetic fibers, and in dyes and pharmaceuticals.

**Features:** Reactivity characteristics of compound are possessed by no other chemical. What may prove to be most important reaction is that with aldehydes and ketones to form oximes.



These find use as antioxidants and stabilizers, for example in chlorinated solvents where they inhibit growth of solid polymers during separation of diolefins from other hydrocarbons. Oximes also act as anti-skinning agents for paints.

**Description:** The three available salts are the acid sulfate, the neutral sulfate, and the chloride.

When inquiring check CP 5567 opposite last page

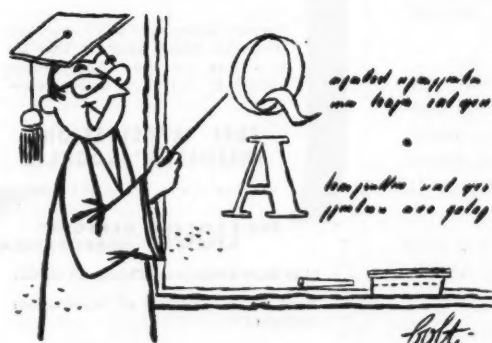
The first of these is the most economical product with a minimum assay of 75%. For higher purity, the neutral sulfate, assaying 95-98%, is recommended. Hydroxylammonium chloride is appreciably soluble in lower aliphatic alcohols and this characteristic, together with its relatively high purity of 98-100%, makes it the preferred material for reagent use or for syntheses of anhydrous media. Choice of which salt to use depends usually on factors other than reactivity.

Physical properties of the hydroxylammonium salts are as follows:

|   | Acid Sulfate                                       | Sulfate  | Chloride                                |
|---|--|--|---|
| Formula   | $\text{NH}_2\text{OH} \cdot \text{H}_2\text{SO}_4$ | $(\text{NH}_2\text{OH})_2 \cdot \text{H}_2\text{SO}_4$ | $\text{NH}_2\text{OH} \cdot \text{HCl}$ |
| Melting point ( $^{\circ}\text{C}$ )                    | Indef.   | dec. 177   | dec. 152                                |
| pH (0.1M aq. soln. @ 25 $^{\circ}\text{C}$ )            | 1.6  | 3.7  | 3.4                                     |
| Solubility (gm/100 gm solvent @ 25 $^{\circ}\text{C}$ ) |  |  |   |
| Water   | 390  | 63.9   | 94.7                                    |
| 95% ethanol   | 4.3  | 0.2  | 10.5                                    |
| Methanol  | 20.2   | 0.1  | 17.5                                    |

Compounds are toxic and care should be taken to avoid ingestion and also breathing of the dust. The acid sulfate will burn the skin, the sulfate and chloride cause mild dermatitis in some persons. Salt solutions corrode most metals, but can be handled satisfactorily in glass-lined equipment or type 304 stainless steel.

(Hydroxylammonium salts are products of Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . or for more information check CP 5569 on handy form opposite last page.)



**Question** — How can I find, quickly, stories about specific chemical materials appearing in this issue?

**Answer** — Check the alphabetical Product Directory (starting on page 201). It's a handy page reference to all articles and advertisements.



## Mathieson Caustic Soda: *why settle for less?*

In the lime-soda process—one of the two important methods of making caustic soda—the causticizing operation begins in huge settling tanks like those above. Here, a soda ash solution is treated with milk of lime, calcium carbonate is precipitated and a dilute caustic liquor obtained. This liquid is then filtered and concentrated to the commercial 50% and 73% solutions, as well as to the solid, flake, and granular forms. Lime-soda process caustic is produced at Lake Charles, La., and Saltville, Va.; four other strategically located plants produce electrolytic process caustic to make Mathieson a major source of this essential chemical raw material.

Multiple-process and multiple-plant facilities give Mathieson's caustic soda customers the dependability they want. It means their source of caustic is not controlled by

seasonal fluctuations in chlorine demand as is sometimes the case when production is limited to the electrolytic caustic-chlorine process. This operational flexibility is also typical of other Mathieson chemicals—5 chlorine plants, 7 sulphuric acid plants, 3 alkali plants, 3 ammonia plants, provide a safety factor that assures a reliable source of chemical raw materials.

Call on us when planning current or future chemical requirements. Perhaps you can buy to better advantage from one of America's largest producers of basic industrial chemicals.

**MATHIESON CHEMICALS**  
OLIN MATHIESON CHEMICAL CORPORATION  
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.



CAUSTIC SODA • SODA ASH • CHLORINE • SULPHURIC ACID • SULPHUR • AMMONIA • NITRATE OF SODA • BICARBONATE OF SODA • NITRIC ACID • SULPHATE OF ALUMINA • SODIUM CHLORIDE PRODUCTS  
ETHYLENE OXIDE • ETHYLENE GLYCOL • DIETHYLENE GLYCOL • TRIETHYLENE GLYCOL • POLYGLYCOLS • DICHLOROETHYLENE • ETHYLENE DICHLORIDE • METHANOL • SODIUM METHYLATE • ETHYLENE DIAMINE

2761

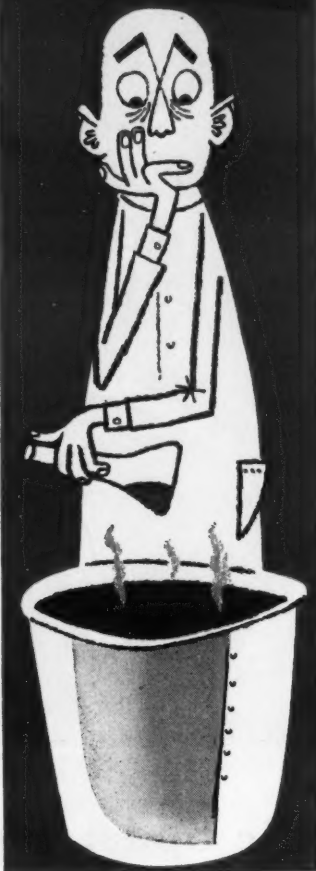
When inquiring check CP 5570 opposite last page

having problems with your present  
low-molecular weight fatty acid?

then try  
**Emfac®**  
**Pelargonic**  
**Acid!**

Because of its odd-carbon length, pelargonic acid acts differently in many instances from low-molecular weight fatty acids occurring in nature. That's why pelargonic acid may give your end product just the exact property you have been striving to attain. Or...it may be the answer to a possible difficult problem of melting point, stability, or solubility. Whatever it be, send for an evaluation sample of unusual, Emfac 1202 Pelargonic Acid and see if it can give your product competitive advantages.

Here's where it fits in the commercial low molecular-weight series of fatty acids.



|                              | Caprylic | Pelargonic | Capric | Lauric |
|------------------------------|----------|------------|--------|--------|
| Carbon Atoms                 | 8        | 9          | 10     | 12     |
| Molecular Weight             | 144      | 158        | 172    | 200    |
| Mp, °C                       | 12       | 10         | 30     | 42     |
| Melting Point, °C            | 16       | 8          | 31     | 43     |
| Boiling Point, °C at 760 mm. | 238      | 255        | 270    | 299    |
| Iodine Value                 | 1        | nil        | 1      | 1      |
| Acid Value                   | 390      | 350        | 325    | 280    |

Mail coupon today for descriptive literature.



Fatty Acids & Derivatives  
Plastolein Plasticizers  
Twitchell Oils, Emulsifiers

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Emery Industries, Inc.  
Dept. CP-3, Carew Tower  
Cincinnati 2, Ohio  
Please send descriptive literature on Emfac 1202 Pelargonic Acid.  
Name.....Title.....  
Company.....  
Address.....  
City.....Zone.....State.....

When inquiring check CP 5571 opposite last page

## MATERIALS

### PVC copolymer resin described in detail

Vinyl chloride copolymer resin, Exon 470 is described in eight-page data bulletin. Physical properties, compatibility, and test data are covered. Three pages of graphs accompany text.

Bul #8B is issued by Chemical Sales Div., Firestone Plastics Co., Div. of The Firestone Tire & Rubber Co., Dept. CP, 500 Firestone Rd., Pottstown, Pa. When inquiring specify CP 5572 on handy form opposite last page.

### Film-forming parting agent can be applied as thin as 1/1000 of an inch

Spray-type, film-forming parting agent specifically developed for reinforced plastic bag molding processes is available. Agent, called Lunn-Lease, can be successfully applied in films as thin as 1/1000". Carrier evaporates immediately when sprayed on mold, leaving a uniform, durable finish which is not tacky. Material is available in quantities from 5 to 55 gallons.

(Parting agent for reinforced plastics is a product of Lunn Laminates, Inc., Dept. CP, Huntington Station, L.I., N. Y. . . . or for more information check CP 5573 on handy form opposite last page.)

### Mutual solvent for organics and water mixtures . . .

intermediates form plasticizers, solvent vehicles

As solvents for hydrophobic and hydrophilic materials, compounds are useful for mixtures containing water and water-insoluble organic chemicals. Plasticizers, solvent vehicles, and other derivatives can be made by reaction with fatty acids, acetic anhydride, or phthalic acid.

Dowanol 8, ethylene glycol ethyl ether, is a resin solvent used in lacquers, dyes, and inks, and in the production of plasticizers.

Dowanol 17, diethylene glycol ethyl ether, is a brake fluid solvent and lacquer solvent. Its penetration of fibers makes it effective in printing and dyeing textiles. It also finds use in production of phthalic plasticizers.

(Glycol ethers are products of The Dow Chemical Co., 1000 Main St., Midland, Mich. . . . or for more information concerning manufacturer's product, reader may simply check 5574 on handy form opposite last page.)

## NEW JOBS for CO<sub>2</sub>

No other gas works so hard or so well—at so many jobs. These are typical examples of CO<sub>2</sub> at work. Scores of other applications, covering all industry, are available from Liquid Carbonic, world's largest producer of CO<sub>2</sub>.

### coffee gets a break

No air wanted! Oxidation during extraction robs coffee of flavor. Instant coffee producers find CO<sub>2</sub> gas provides an ideal protective "blanket" that keeps air out—flavor in.

### bugs beware

Problem—grinding waxy DDT solids into useable powder. The generated heat tended to turn them into liquid. Pulverized dry ice mixed with the large pieces of DDT froze them hard and brittle—the rest was easy!

### miracle fibre needs miracle gas

Expanded into a chamber, liquid CO<sub>2</sub> produced the low temperatures needed to separate paraxylene (an ingredient of DACRON®) from petroleum. Result—no more baggy knees!

\*Du Pont's trade-mark for its polyester fibre

### next case...Yours

There's practically no end to the important jobs that CO<sub>2</sub> combined with Liquid Carbonic savvy—is doing. Chances are this combination can come up with some surprising answers for you, too.

For more examples of CO<sub>2</sub>'s amazingly diversified talents, send for LIQUID's new free booklet, "Applications Unlimited." Just use the coupon below.

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Address.....

City.....Zone.....State.....

When inquiring check CP 5575  
opposite last page

CHEMICAL PROCESSING

**Fabric softeners resist yellowing during high-temp treatment and long storage . . .**

agents exhibit good anti-static characteristics

**Uses:** Softening cotton, rayon, nylon, wool, and synthetic fibers where maximum whiteness is desired. Recommended as a softener for use with resin finishes.

**Features:** Finishes resist yellowing during both high-temperature treatment and on long storage of treated fabrics. Softening agents exhibit high anti-static characteristics and resist dry cleaning and washing to a moderate degree.

**Description:** Four cationic softeners, called Dextrol Research Softener #20, #21, #22, and RDA, differ only in pH and the hand they produce on both natural and synthetic fibers. The products are compatible with most resin mixes as well as with starch, dextrans, and gums. They can be applied in either the final rinse after dyeing or by padding.

(Fabric softeners are products of Textile Chemical Div., Dexter Chemical Corp., Dept. CP, 18 Edgewater Rd., New York 59, N.Y. . . . or for more information check CP 5576 opposite last page.)

**Effective brominating agent: phosphorus tribromide . . .**

can convert alcohols to corresponding bromides, acids to acid bromides

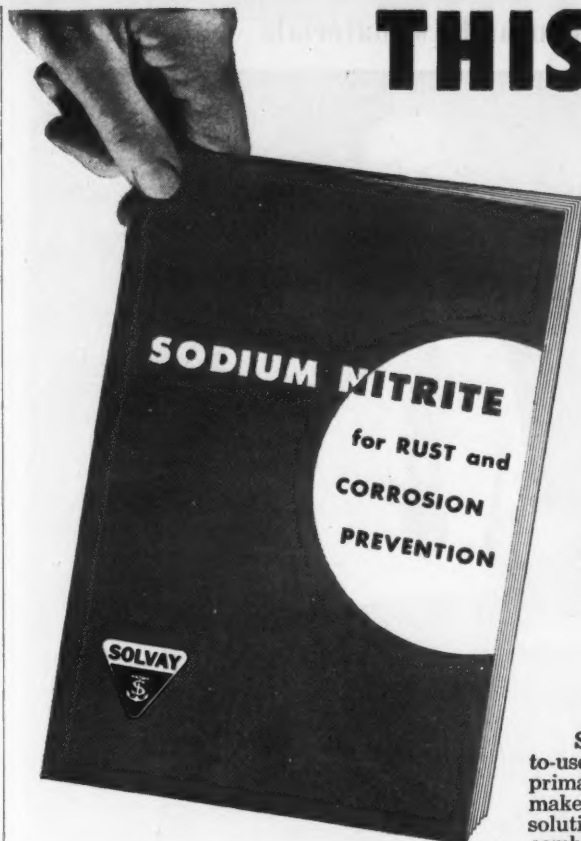
**Uses:** Compound is an effective brominating agent. It can be used to convert alcohols to corresponding bromides or acids to acid bromides. This property is especially useful in preparing bromides from sensitive alcohols.

**Features:** No rearrangement occurs, and bromide yields are high. Preparation methods are convenient and easily carried out.

**Description:** Phosphorus tribromide is a dense liquid (sp gr: 2.88) having a high boiling point. Boiling range is 2°C. It is packaged in glass bottles of 20 lb net weight.

(PBr<sub>3</sub> is a product of Michigan Chemical Corp., Dept. CP, St. Louis, Mich. . . . or for more information check CP 5577 opposite last page.)

Estimating costs? Look at weight volume cost conversion chart on page 186



# THIS NEW BOOK

Tells How To

## CONTROL or PREVENT RUST and CORROSION

## with SOLVAY SODIUM NITRITE and Sodium Nitrite Mixtures

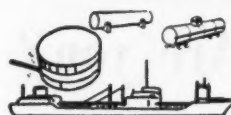
SOLVAY Sodium Nitrite provides a low-cost, safe and easy-to-use means of protecting many metals from rust and corrosion, primarily iron and steel. Dilutions as low as 1/10th of 1% will make water solutions non-corrosive; and 3 to 5% spray or dip solutions will produce protective films on metal surfaces. When combined with materials such as phosphates or caustic soda, sodium nitrite's protective action can be extended or obtained during cleaning, neutralizing or similar operations.

This new booklet contains detailed information on how SOLVAY Sodium Nitrite prevents rust and corrosion, and how its protective action can be utilized, either alone or in combination with other materials. It also contains an extensive bibliography covering 59 published papers on the use of sodium nitrite and nitrite compounds for corrosion prevention.

For your free copy, fill out and mail the coupon today. There is no cost or obligation.\*

\*In Western Hemisphere Countries.

### A Few Typical Applications



Hydrocarbon service  
and fuel oil tanks



Air conditioners, heat exchangers  
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New or reconditioned  
drums, barrels or cans



Metal parts in process or storage



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Gentlemen: Please send me without cost or obligation\*

☐ Your new book "SODIUM NITRITE for Rust and Corrosion Prevention"

☐ Sample of SOLVAY Sodium Nitrite

Name \_\_\_\_\_

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Title \_\_\_\_\_

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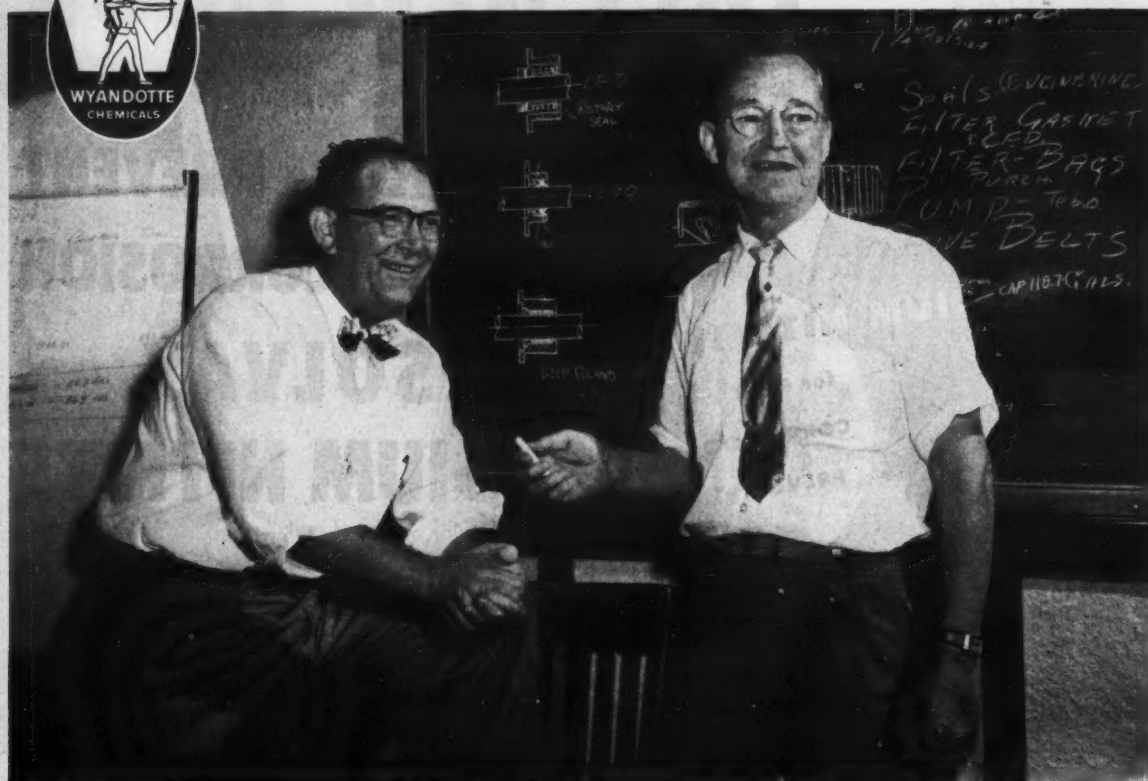
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Soda Ash • Snowflake® Crystals • Potassium Carbonate • Calcium Chloride • Caustic Potash  
Sodium Bicarbonate • Ammonium Bicarbonate • Cleaning Compounds • Ammonium Chloride  
Sodium Nitrite • Chloroform • Caustic Soda • Monochlorobenzene • Para-dichlorobenzene  
Ortho-dichlorobenzene • Chlorine • Methylene Chloride • Methyl Chloride • Carbon Tetrachloride

When inquiring check CP 5578 opposite last page



## Dependable Source for Chemical Raw Materials



Dr. W. L. McCracken (left), director of research for the Detrex Corporation, works out a cleaning equipment problem with Vice President C. F. Dinley.

## Detrex, pioneer in cleaning products, is benefiting from the Pluronics. Are you?

As pioneers in the cleaning field, developers of the fabulous new ultrasonic process for production cleaning, and one of the foremost makers of cleaning equipment, Detrex Corporation, Detroit, Mich., is well qualified to evaluate the various raw-material ingredients that go to make up quality cleaning compounds.

"We have found Wyandotte Pluronics valuable in our alkaline cleaning preparations as well as in other formulations used for the preparation of metal surfaces," says Dr. W. L. McCracken, Detrex director of research. "We particularly like them for their non-foaming qualities in alkaline-type metal cleaners. They also provide in-

creased detergency, have free rinsing characteristics, and give the formulations stability over a wide range pH. By introducing the Pluronics in some of our products, we eliminated the need for anti-foaming agents and, at the same time, saved a lot of service work.

"We have found Wyandotte heavy chemicals and Wyandotte service most satisfactory over the years," states Dr. McCracken.

Whether you make metal cleaners or mechanical-dishwashing compounds, you will find the Pluronics\* are not just another series of non-ionics. Actually, they are so unique, so different that, unless your evaluation takes in their over-all advantages and better all-around

balance, you may not have visualized their full potential. If you are not already using the Pluronics, write us for data and free samples, giving as much detail on your projected use as possible. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

\*REG. U.S. PAT. OFF.



### HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine  
Calcium Carbonate • Calcium Chloride • Glycols • Chlorinated  
Solvents • Synthetic Detergents • Agricultural Insecticides  
Other Organic and Inorganic Chemicals

When inquiring check CP 5579 opposite last page

## MATERIALS

### Higher phosphate content in cleaning materials made possible . . .

up to 11% held in solution by nonionic of fatty acid alkylolamide type

**Uses:** In heavy-duty hard surface cleaning materials.

**Features:** Product makes it possible to hold in solution a phosphate content as high as 11% for greater cleaning power. No difficulty is encountered in layering-out of finished product.

**Description:** This product, designated HDA-7, is a nonionic of the fatty acid alkylolamide type. Suggested formulation offered by company has a cloud point of approximately 35°F and its efficiency is not impaired upon thawing after freezing.

(Nonionic fatty acid is a product of Stepan Chemical Co., Dept. CP, 20 N. Wacker Dr., Chicago 6, Ill. . . . or for more information check CP 5580 on handy form opposite last page.)

### Sulfonic acid and its salts find use as emulsifiers, rust preventives . . .

compounds have relatively high molecular weights and good solubilities

Alone, or as a salt, high molecular weight sulfonate can be used in rust presentative formulations, and as emulsifiers, wetting agents, and dispersants.

**Petronic Acid** is a petroleum sulfonic acid having a molecular weight of 418-438, and as the sodium salt, 440-460. Soluble in petroleum solvents and oils, ethers, ketones, and long chain aliphatic alcohols, acid is suggested for use as basic material for preparation of various metal salts of petroleum sulfonic acids. It has these typical properties:

| Composition (% by wt)   |      |
|-------------------------|------|
| Sulfonic acid           | 50   |
| Sulfuric acid           | 0.5  |
| Mineral oil             | 48.5 |
| Water                   | 1    |
| Acid number (mg KOH/gm) | 70   |

**Rosin Amine Petronate** is an ashless amine salt of a petroleum sulfonic acid. Solubility characteristics are similar to those of the above acid. Suggested applications include as a rust preventive for light hydrocarbon distillate systems and where an ashless sulfonate is indicated. Material tests 52% (by wt) rosin amine sulfonate.

**Ammonium Petronate** is the ammonium salt. Solubility characteristics are also similar to the above, as is suggested use. Ashless, the product assays 44.0% sulfonate.

## MATERIALS

Barium Petronate, the barium salt, is soluble in petroleum products and is suggested as a rust and corrosion preventive. Available in both neutral and basic form, material is 51% barium sulfonate complex. Other properties include:

|                                | Neutral | Basic |
|--------------------------------|---------|-------|
| Ba in sulfonate complex (wt %) | 13      | 13    |
| Base No. (mg KOH/gm)           | 0       | 45    |
| Molecular weight               | 981     | 981   |
| As sodium salt                 | 445     | 445   |

Calcium Petronate also is available in neutral and basic form. Soluble in petroleum products, it is suggested as a rust and corrosion preventive. It is also useful in preparation of water-in-oil emulsions. As calcium salt, mw is 888. Material is 41% calcium sulfonate complex. Basic form has base number of 23.

(Petronic Acid and salts are products of L. Sonneborn Sons, Inc., Dept. CP, 300 Fourth Ave., New York 10, N. Y. . . . or for more information check CP 5581 opposite last page.)

### Prevents decomposition of Heptachlor by catalytic action of carrier . . .

supplied as a liquid, deactivator is sprayed on carrier, is economical to use

**Uses:** As a deactivator, preventing decomposition of Heptachlor and certain other chlorinated hydrocarbon insecticides by their carrier.

**Features:** Supplied as a liquid, deactivator is easily sprayed on carrier in the mixer, before insecticide is added. Intimate contact is obtained readily. Material is economical to use.

**Description:** Deactivator "H" is an organic liquid, designed specifically for Heptachlor and similar insecticides. Manufacturer also has available an indicating solution that shows by a color change when carrier deactivation is complete.

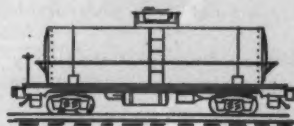
(Deactivator for Heptachlor carrier is a product of Velsicol Corp., Dept. CP, 330 E. Grand Ave., Chicago 11, Ill. Check CP 5582 opposite last page.)

### Gives description, analysis, uses of phosphorous compounds

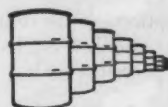
Description, typical analysis, principal uses, and containers for 13 of company's basic phosphorus compounds are detailed in eight-page brochure.

"Basic in Phosphorus" is issued by Chemicals Div., Virginia-Carolina Chemical Corp., Dept. CP, 401 E. Main St., Richmond 8, Va. When inquiring specify CP 5583 on handy form opposite last page.

## AVAILABLE IN



## TANK-CAR AND



## DRUM QUANTITIES

# Du Pont Hexalin®

Cyclohexanol

Whether you require one drum or tank-car lots, delivery of "Hexalin" is made promptly upon receipt of your order.

"Hexalin" is shipped as follows:

- Tank cars—8,000-gallon and 10,000-gallon capacities.
- Non-returnable drums, 55-gallon capacity—net weight: 430 lbs.

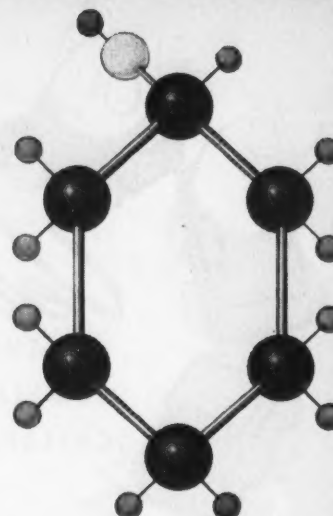


BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY

**Polychemicals**  
DEPARTMENT  
**CHEMICALS • PLASTICS**

# Investigate DU PONT HEXALIN®

Cyclohexanol (C<sub>6</sub>H<sub>11</sub>OH)



### SPECIFICATIONS:\*

- Boiling Range at 760 mm.: 160.0°C. Min. to 162.4°C. Max.
- Specific Gravity 25°/25°C.: 0.946-0.950

### PROPERTIES

- Clear, colorless, oily liquid with a camphoraceous odor
- Soluble in water at 20°C. to the extent of 3.6% by weight
- Water is soluble in "Hexalin" at 20°C. to the extent of 11% of weight
- Miscible with: Ethanol, ethyl ester, linseed oil, petroleum solvents, aromatic hydrocarbons and most other common organic solvents
- Dissolves alkyd resins, alcohol-soluble phenolic resins, ethyl cellulose.

### PRINCIPAL USES

**PLASTICS:** Ingredient used in the manufacture of ester plasticizers.

**DETERGENT:** Stabilizer and homogenizer for soap and synthetic detergent emulsions.

**PETROLEUM:** Intermediate for lubricating oil additives.

**TEXTILES:** Stabilizer and homogenizer in textile soaps; stabilizer for emulsions; solvent for dyes; kier boiling assistant.

**FINISHES:** Solvent in lacquers, shellacs and varnishes; high boiling solvent in nitrocellulose lacquers to retard evaporation and prevent blushing.

\*Partial Listing

**METAL:** Degreasing agent; solvent in metal polishes.

**MISCELLANEOUS:** Dry-cleaning fluid ingredient; solvent in furniture polishes, shoe creams and floor waxes.

### GENERAL ADVANTAGES

"Hexalin" cyclohexanol is a good solvent for several classes of dyes including basic, chrome, some acid and the majority of acetate rayon dyes.

"Hexalin" does not dissolve cellulose nitrate, cellulose acetate, rubber, copal, dammar, or elemi.

To obtain full information on Du Pont "Hexalin," just mail the coupon below, or write on your letterhead today.

### Which of these other chemicals are you interested in?

- ☐ Adipic Acid
- ☐ Crystal Urea
- ☐ Diglycolic Acid
- ☐ Hydroxyacetic Acid
- ☐ Hytrol® O Cyclohexanone
- ☐ Lorol® Fatty Acids
- ☐ Methanol

E. I. du Pont de Nemours & Co. (Inc.)  
Polychemicals Dept. 583, Wilmington 98, Del.  
Please send me full information on Du Pont "Hexalin" Cyclohexanol. I am particularly interested in using "Hexalin" for the following applications:

Name \_\_\_\_\_ Position \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5584 opposite last page



#### MAXIMUM PERFORMANCE AT MINIMUM COST

No other manufacturer produces a complete line of organic Chelating Agents for the control of metallic ions throughout the entire pH range. This means that the selection of the right Versene product can give your process or formulation *maximum chelating power at minimum cost* — regardless of the pH involved.

#### VERSENE — FOR METAL ION CONTROL

The importance of metal ion (trace metal) control is now fully recognized in Industry, Agriculture and Medicine. Metallic ion excesses or deficiencies represent the difference between success or failure in practically all chemical reactions — from soap detergency to metabolism in living things. Versene and Versene products provide the metal ion control desired with mole-for-mole accuracy.

#### UNDUPPLICATED QUALITY

As pioneers in the Chemistry of Chelation and the manufacture of Chelating Agents, the five basic Versene products and the eleven additional Versene Compounds, represent unduplicated quality and guaranteed *uniformity* of chelating power. They still set the standards of chelation. A quarter-century of chelate research and experience is at your command. Ask for Technical Bulletin No. 2. Chemical Counsel on request.



*"Chemistry's most precise chemicals"*  
**VERSENE INCORPORATED**

subsidiary of THE DOW CHEMICAL COMPANY  
 FRAMINGHAM, MASSACHUSETTS

#### WAREHOUSE STOCKS

Chat. S. Tanner Co., 2300 No. Brevard St., Charlotte, N. Carolina  
 Kral Chemical Co., Inc., 917 West 18th St., Chicago 8, Ill.  
 Independent Chemical Corp., One Hanson Place, Brooklyn 17, N. Y.  
 Borada & Page, Inc., Houston, Dallas, Corpus Christi, New Orleans,  
 St. Louis, Wichita, Oklahoma City, Tulsa, Kansas City, Mo.  
 Braun-Knecht-Heimann Co., Salt Lake City, Utah  
 Braun-Knecht-Heimann Co., San Francisco, Calif.  
 Van Waters & Rogers, Inc., Seattle, Wash. & Portland, Ore.  
 Braun Corporation, Los Angeles, California  
 George Mann & Co., Inc., 251 Fox Point Blvd., Providence, R. I.  
 European Manufacturing Agent:  
 Rexolinfabriken Aktiebolag, Helsingborg, Sweden

When inquiring check CP 5585 opposite last page

## MATERIALS

**Prevents color degradation  
 and sediment formation  
 in fuel oils . . .**

does not create unfavorable fuel characteristics

**Uses:** As a color stabilizing agent for fuel oil, designed to prevent color degradation and sediment formation.

**Features:** Stabilizer prevents formation of color bodies, reduces organic sediment formation, and inhibits rust. It does not create unfavorable fuel characteristics because it is insoluble in water and is not subject to depletion by water extraction. Secondly, it will not form fuel oil-water emulsions, eliminating oil haze or foaming problems.

**Description:** Santolene J is a nonmetallic dark brown liquid, completely soluble in oil. It has these properties:

|                                 |      |
|---------------------------------|------|
| Sp gr (60°/60°F)                | 0.85 |
| Flash point (°F)                | 200  |
| Nitrogen (%)                    | 5.7  |
| Viscosity (centistokes @ 210°F) | 1.35 |

Normal dosage for most base oils is 25 lb/1000 bbl of oil. The stabilizer, an organic base, will cause skin irritation if prolonged contact of the undiluted compound occurs with the skin. Inhalation of vapors should be avoided.

(Color stabilizer for fuel oil is a product of Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 12th and Delmar, St. Louis 1, Mo. . . or check CP 5586 on handy form which is located opposite last page.)

#### Study use of extender pigments in polyvinyl acetate paints

The important role that extender pigments play in polyvinyl acetate paints is the subject of a detailed, systematic study reported in a 22-page technical bulletin. Report, offered as a guide to the paint chemist, also describes effects of various extender pigments on hiding power. Comparisons are made in white paints at three different rutile levels and at pigment volume concentrations from 25 to 50%.

Means were developed for enhancing hiding power of PVA paints without increasing amount of prime pigment required. Film properties such as brightness, color, gloss, sheen, and tinting strength are considered. Effects of extenders on some of the rheological properties of the paints are discussed.

Technical Report No. 27-T is issued by Sierra Talc & Clay Co., Dept. CP, P.O. Box 390, South Pasadena, Calif. When inquiring specify CP 5587 on handy form opposite last page.

**for Coconut Oil**

**Fatty Acids**

**and Methyl Esters**

**rely on  
 EL DORADO**

**for PURITY  
 SERVICE  
 UNIFORMITY**

El Dorado has specialized in coconut oil products for more than half a century. That's one big reason you can depend on the performance of El Dorado products in your formulations. You'll find that El Dorado's standards are the highest in the industry.

| FATTY ACIDS   |          |           |
|---------------|----------|-----------|
| CAPRYLIC      | ELDHICO  | CAPRIC    |
| LAURIC        | COCONUT  | MYRISTIC  |
|               | PALMITIC |           |
| METHYL ESTERS |          |           |
| CAPROATE      | ELDO 18  | CAPRYLATE |
| CAPRATE       | COCONATE | LAURATE   |
| MYRISTATE     |          | PALMITATE |

For samples and specifications, write  
 Dept. P

**Rely on**



Main office:  
 PO Box 599, Oakland 4, Calif.

Plants:  
 Bayonne, N. J., Oakland, Calif.

When inquiring check CP 5588  
 opposite last page

CHEMICAL PROCESSING

## MATERIALS

### Complete data on thymidine

Structural formula, physical, chemical, and biochemical properties, outline of therapeutic effects, and a list of references on thymidine, now commercially available, are given in booklet.

Bul 141 is issued by Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mt. Vernon, N.Y. Specify CP 5589 on handy form opposite last page.

### Announce availability of $C^{14}$ -tagged pyruvic acid


Radioactive carbon ( $C^{14}$ ) pyruvic acid as the sodium salt (-2-C-14 and -3-C-14) is now available at one millicurie per millimole in four package sizes from 1.0 to 0.05 millicurie under regular AEC licensing procedures.

( $C^{14}$ -tagged pyruvic acid is available from Nuclear-Chicago, Dept. CP, 229 W. Erie St., Chicago 10, Ill. Check CP 5590 on handy form opposite last page.)

### Up-to-date information on insect toxicant

Technical booklet of 24 pages gives latest information on properties and uses of Thanite, insect toxicant. Formulations, physiological activity, methods of assay, and bibliography are covered in detail. Fields of application described include household sprays, livestock sprays, aerosols, and pesticides.

"Thanite" is issued by Hercules Powder Co., Inc., Dept. CP, 940 Market St., Wilmington, Del. Specify CP 5591 on handy form opposite last page.

For more information on product at right, specify CP 5592 . . . see information request blank opposite last page. 



**CATALOGUE**

**ANTARA**

detergents  
wetting agents  
emulsifiers  
brighteners  
sequestrants  
dyeing assistants

**ANTARA CHEMICALS**  
A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION  
435 HUDSON STREET, NEW YORK 14, N. Y.

## GET THIS *NEW* CHEMICALS CATALOGUE by return mail!

Antara presents a new and completely revised edition of its chemical catalogue, giving basic information on the chemicals it produces.

Information on chemical composition, physical properties and application is given on the established products and on new chemicals released in the past few months. In addition, there is a listing of Antara's intermediates:

For your free copy of the new Antara Chemicals Catalogue, fill in the coupon below and mail it today.

### ANTARA® CHEMICALS

A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION  
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formaldehyde isn't "formaldehyde" any more...

For low solids resins it's

# CELANESE\* FORMALIN

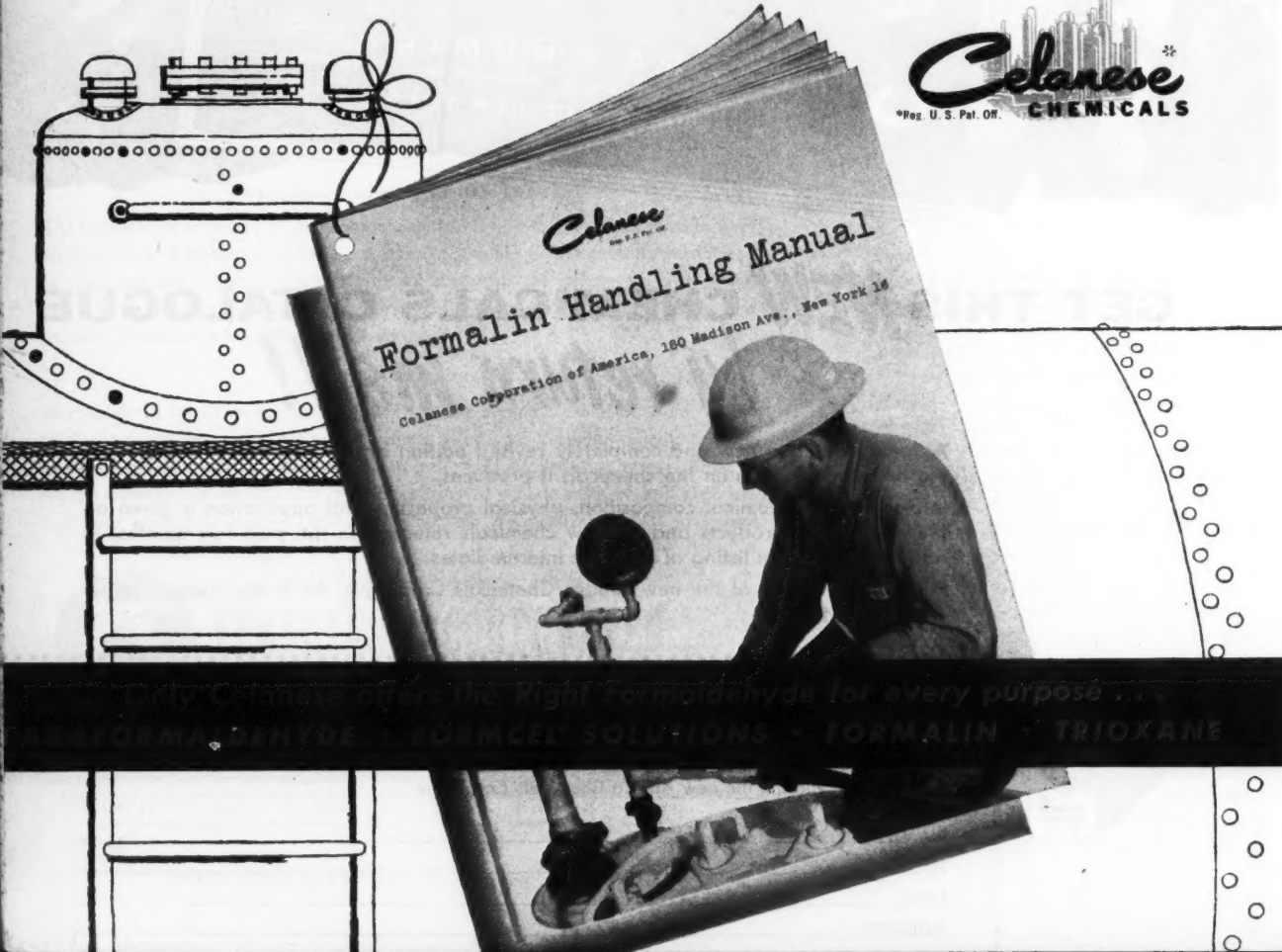
Formalin—one of the hard-working Celanese specialized formaldehydes—continues to be the right formaldehyde for low solids resins and adhesives. And the right source for Formalin is still Celanese integrated production that assures continuous supplies for all industries.

## Revised Edition of Celanese Formalin Manual

The Celanese Formalin Handling Manual is a valuable reference for technical and non-technical personnel. Clear and concise, it covers storage, handling, analysis methods, safety precautions, temperature effects, and all other vital information for users of Formalin. Send for your free copy to Dept. 591-C, Celanese Corporation of America, Chemical Division, 180 Madison Avenue, New York 16, N. Y.



**Celanese**  
Formalin Handling Manual  
Celanese Corporation of America, 180 Madison Ave., New York 16



## MATERIALS

### High tensiles, elongation, and tear-resistance in silicone rubbers

**Uses:** In molded items and extrusions, such as O-rings, seal boots, diaphragms, and aircraft seals.

**Features:** Silicone rubber possesses high tensile strengths, elongations, and tear-resistance, along with weather- and ozone-resistance and high dielectric strength. No change in properties noted from -65°F to 400°F.

**Description:** COHRLastic HT 400 is designed for molding applications; HT 600, for extrusion. The silicone rubbers have these characteristics:

|                         | HT 400    | HT 600   |
|-------------------------|-----------|----------|
| Unaged                  |           |          |
| Tensile (psi)           | 1400—2000 | 700—1100 |
| Elongation (% at break) | 700—850   | 700—1100 |
| Hardness (Shore A Duro) | 50-60     | 40-60    |
| Tear-resistance (lb/in) | 225—300   | 175—275  |

|                                 |     |     |
|---------------------------------|-----|-----|
| Aged 70 hr @ 300°F              |     |     |
| Change in tensile (%)           | -20 | +30 |
| Change in elongation (%)        | -25 | -40 |
| Change in hardness (points)     | +15 | +10 |
| Aged ASTM #1 oil, 70 hr @ 300°F |     |     |
| Change in tensile (%)           | -60 | -35 |
| Change in elongation (%)        | -60 | -75 |
| Change in hardness (points)     | +15 | +25 |
| Volume increase (%)             | +5  | +7  |

|  |     |      |
|--|-----|------|
| After 70 hr @ 212°F, under compression |     |      |
| Compression set (%)                    | 22  | 24   |
| Low temp flex (pass, °F)               | -65 | -100 |

(HT silicone rubbers are available in form of sheets, molded parts, or fabricated articles from Connecticut Hard Rubber Co., Dept. CP, 407 E. Street, New Haven, Conn. . . . or for more information reader may simply check CP 5593 on handy form opposite last page.)

For more information on product at left, specify CP 5594 . . . see information request blank opposite last page.

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MARCH

**Describes carbon dioxide uses:  
both new, long-established**

The ever-increasing number of uses for carbon dioxide is the subject of 16-page pocket-size booklet. New applications, such as for inert gas-shielded arc welding, in obtaining low temperatures required in separating paraxylene from petroleum products, as a foaming agent in manufacture of rubber and open cellular plastic sponge, in freeze-drying, in pulverizing of materials with low melting point, and in many food applications, are described.

"Applications Unlimited" is issued by The Liquid Carbonic Corp., Dept. CP, 3100 S. Kedzie Ave., Chicago 23, Ill. When inquiring specify CP 5595 on handy form opposite last page.

**High assay glyceric acid  
now on market**

**Uses:** Organic and biochemical synthesis, pharmacological and pathological studies involving fermentation and metabolism studies.

**Features:** Reagent has minimum assay of 95% (former assay of glyceric acid — 30%).

**Description:** Reagent is available from stock; no need for custom manufacture, as was required previously.

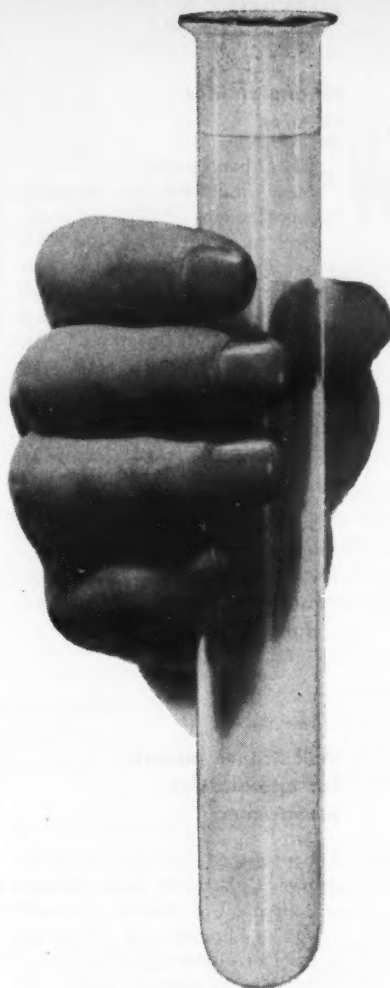
(Reagent A-126 [Glyceric Acid] is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 5596 on handy form opposite last page.)

**Solubilities of long-chain organics  
made easy by graphical method**

Graphical method for determining solubilities of long-chain organic compounds as a relationship of their number of carbon atoms should be of importance to processors of vegetable fats and oils, as well as researchers. This graphical correlation permits solubility determinations not available through the literature, and eliminates necessity of synthesizing and purifying the compound to make measurements.

Method has been applied to published solubility data for 138 systems involving 11 homologous series of long-chain organics and 17 different solvents, over a wide range of temperatures.

Publication ARS-72-1 is issued without charge by Southern Regional Research Laboratory, USDA, 2100 Robert E. Lee Blvd., New Orleans 19, Louisiana.



dioctyl azelate

dimethyl phthalate

di-(methoxyethyl) phthalate

di-isobutyl phthalate

diethyl phthalate

dibutyl phthalate

di-isobutyl adipate

triacetin

tributyrin

di-(2-ethylhexyl) adipate

dioctyl phthalate (DOP)

di-isooctyl phthalate (DIOP)



# Eastman plasticizers

As a leading supplier of quality plasticizers, Eastman is pleased to announce the addition of di-isooctyl phthalate to its line. Manufactured from a new, improved type of isooctyl alcohol, this plasticizer possesses the excellent qualities for which the present Eastman plasticizers are noted. It is available in drum, tank truck and tank car quantities. DIOP is only one of the many fine plasticizers made by Eastman. For further information on any of the plasticizers listed above, write or call your nearest Eastman representative.

**SALES OFFICES:** Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 Michigan Ave.; Houston—412 Main St.; St. Louis—Continental Bldg. **West Coast:** Wilson Meyer Co., San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Salt Lake City—73 S. Main St.; Seattle—821 Second Ave.

**Eastman**  
CHEMICAL PRODUCTS, INC.,  
KINGSPORT, TENNESSEE  
subsidiary of EASTMAN KODAK COMPANY

When inquiring check CP 5597 opposite last page



Furafil 100 is a dark brown lignocellulose flour, 99% of which passes through a 100-mesh screen. For the past three years Furafil 100 has been available in the Northwest where it has achieved success as an extender for plywood glues. Now it also becomes available at modest cost to consumers East of the Rocky Mountains.

#### IF YOU NEED:



A dependable filler and extender for phenolic resin molding powders and glues,

A filler for rubber compositions,

An anticaking agent, or

A highly absorptive carrier for liquid ingredients being blended with other solids,

Then Furafil 100 will interest you.

The best way to evaluate Furafil 100 in a given application is by actual test. WRITE US for a sample and a copy of our technical bulletin.

The Quaker Oats Company

CHEMICALS DEPT.

336Z The Merchandise Mart, Chicago 54, Illinois  
Room 536Z, 120 Wall Street, New York 5, New York  
Room 436Z, P. O. Box 4376, Portland 8, Oregon

When inquiring check CP 5598 opposite last page

## MATERIALS

### Ethanolamines covered

The ethanolamines are used in many industries as emulsifier intermediates and as gas scrubbers to remove  $H_2S$  and  $CO_2$ . Specifications, chemical reactions, and properties of the compounds are covered in detail by 22-page technical bulletin. Uses, handling, and safety precautions are included, as is a tabulation of properties of the ethanolamine soaps.

"Ethanolamines — Monoethanolamine, Diethanolamine, Triethanolamine" is issued by The Dow Chemical Co., 1000 Main St., Midland, Mich. When inquiring specify 5599 on handy form opposite last page.

### Will license patents for epoxidation, plasticizers

To encourage research on epoxidation in plasticizer field, company will license U.S. patents 2,458,454 (1949) "Process of Preparing Epoxy Derivatives from Unsaturated Aliphatic Compounds," and 2,559,177 (1951) "Plasticized Polyvinyl Resin Compositions."

(Patents are assigned to Research Laboratories, General Mills, Inc., Dept. CP, 2010 E. Hennepin Ave., Minneapolis 13, Minn. . . . check CP 5600 on the convenient Reader Service slip located opp. last page.)

### Drilling mud consistency improved by dispersant over wide pH range . . .

water-soluble, it need not first be dissolved in caustic

Uses: As a dispersant for oil well drilling muds.

Features: Consistency of mud is improved by the product. Dispersant is water-soluble (it need not first be dissolved in caustic), and is effective over a wide pH

## SOLVENTS NOW AVAILABLE FOR 2c PER GALLON

Many industrial solvents, worth more than 50c per gallon, can be recovered for re-use at a cost of only 2c per gallon. That is direct operating cost per gallon of a Barnebey-Cheney solvent recovery system. This savings potential will pay for a Barnebey-Cheney recovery system in a short time. In addition, objectionable odors no longer contaminate work areas, nor are they allowed to spread throughout the neighborhood.

If your business uses volatile solvents, you'll be dollars ahead with a Barnebey-Cheney recovery system. Wire, write or call for full information, there's no obligation.

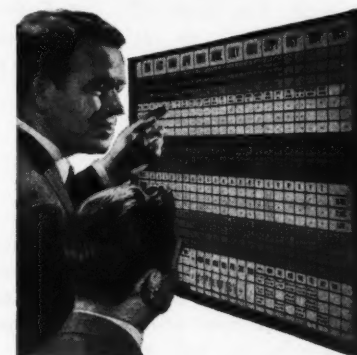
**BARNEBEY-CHENEY**  
*Company*

CASSADY AT EIGHTH COLUMBUS 19, OHIO

In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

When inquiring check CP 5601 opposite last page

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### THE BOARDMASTER SYSTEM

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- ★ Simple and Flexible—Easily Adapted to Your Operations
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- ★ Compact, Attractive. Made of Metal. Over 50,000 in Use.

Complete Price **\$49<sup>50</sup>** Including Cards

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24-Page ILLUSTRATED BOOKLET AA-10  
Without Obligation

GRAPHIC SYSTEMS, 55 W. 42nd St., New York 36

When inquiring check CP 5602 opposite last page

CHEMICAL PROCESSING

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189-195°C  
pressure.

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## MATERIALS

range. It requires far less supplementary additives, has lasting effectiveness.

**Description:** Rayflo is a complex polymeric polyphenol, derived from bark of the western hemlock. Supplied as a reddish-brown powder, dispersant is a complete replacement for imported materials, such as quebracho.

(Drilling mud dispersant is a product of Rayonier Incorporated, Dept. CP, 52 Vanderbilt Ave., New York 17, N.Y. . . . or for more information check CP 5603 on the convenient Reader Service slip which is located opposite last page.)

### Three additional esters of boric acid listed

Three high mw organic esters of boric acid are offered in pilot-scale quantities. Soluble in most organics, compounds hydrolyze somewhat slowly on contact with water.

**Tri-hexylene-glycol biborate**,  $C_{18}H_{36}O_6B_2$ , has a sp gr of 0.982 (@ 21°C) and boils at 143-149°C (@ 2mm). A colorless liquid, compound has a flash point of 345°F.

**Tri-*o*-cresyl borate**,  $C_{21}H_{21}O_3B$ , is a straw yellow liquid, of sp gr 1.079 (@ 22°C), and having a 189-195°C boiling range at 2 mm pressure.

**Tri-(2-cyclohexylcyclohexyl) borate**,  $C_{36}H_{68}O_3B$ , is a white solid melting at 172-175°C.

(Boric acid esters are products of Pacific Coast Borax Co., Div. of Borax Consolidated, Ltd., Dept. CP, 100 Park Ave., New York 17, N.Y. . . . or for more information reader may simply check CP 5604 on the convenient Reader Service slip which is located opposite last page.)

For more information on product at right, specify CP 5605 . . . see information request blank opposite back page.

# gaf's NEW PLANT

## FOR HIGH PRESSURE ACETYLENE DERIVATIVES

to be on stream by the end of 1955  
the following products are among those which will be available in commercial quantities

|  |  |  |   |
|--|--|--|---|
| <b>PROPARGYL ALCOHOL</b><br>$HC \equiv CCH_2OH$  | Three centers of reactivity. Chemical intermediate for pharmaceuticals, agricultural chemicals, etc. Corrosion inhibitor and stabilizer for halogenated compounds.                             | <b>2-PYRROLIDONE</b><br>$\begin{array}{c} H_2C-CH_2 \\   \quad \quad   \\ H_2C \quad C=O \\   \\ N \\   \\ H \end{array}$  | Polymerizes to high molecular weight, linear, nylon-type, polyamide condensation product. Gives $\gamma$ -aminobutyric acid and derivatives, also N-acyl lactams.   |
| <b>PROPARGYL HALIDES</b><br>$HC \equiv CCH_2X$   | Three centers of reactivity. Chemical intermediate for terpenes and pharmaceuticals, etc. Agricultural uses as soil fumigant, etc.   | <b>N-METHYL-2-PYRROLIDONE</b><br>$\begin{array}{c} H_2C-CH_2 \\   \quad \quad   \\ H_2C \quad C=O \\   \\ N \\   \\ CH_3 \end{array}$                                | Powerful organic solvent for acrylonitrile polymers and copolymers, cellulose triacetate, etc. Selective solvent for acetylene in natural gas. Spinning agent for polyvinyl chloride solution.  |
| <b>2-BUTYNE-1,4-DIOL</b><br>$HOCH_2C \equiv CCH_2OH$   | Reacts as a glycol and di-substituted acetylene. Chemical intermediate for solvents, plasticizers, plastics, etc. Corrosion inhibitor and stabilizer for halogenated compounds.                | <b>N-VINYL-2-PYRROLIDONE</b><br>$\begin{array}{c} H_2C-CH_2 \\   \quad \quad   \\ H_2C \quad C=O \\   \\ N \\   \\ CH=CH_2 \end{array}$                              | Will copolymerize with almost all vinyl monomers. Permits modification of many properties in existing homopolymers. Gives control of hydrophobic and hydrophilic properties of products.  |
| <b>1,4-BUTANE-DIOL</b><br>$HOCH_2CH_2CH_2CH_2OH$   | Reacts as dihydric alcohol. Chemical intermediate for polyesters, polyurethanes, polyamides and cyclic compounds. For use in plasticizers, resins, fibers. Solvent. Humectant.                 | <b>POLYVINYL-PYRROLIDONE (PVP)</b><br>$\begin{array}{c} H_2C-CH_2 \\   \quad \quad   \\ H_2C \quad C=O \\   \\ N \\   \\ CH-CH_2 \end{array} \quad \left[ \right]_n$ | Binder, stabilizer, detoxifier, protective colloid, thickener, film former. Physiologically compatible. Wide solubility range. For use in pharmaceuticals, cosmetics, foods, detergents, dye stripping, synthetic fiber additive, size component, lithography, agricultural chemicals, etc. |
| <b>BUTYROLACTONE</b><br>$\begin{array}{c} H_2C-CH_2 \\   \quad \quad   \\ H_2C \quad C=O \\ \quad \quad \backslash \quad / \\ \quad \quad O \end{array}$ | Powerful organic solvent for polyacrylonitrile, cellulose acetate, polystyrene, etc. Selective solvent for acetylene in natural gas. Chemical intermediate for aliphatic and cyclic compounds. |  |   |

Until the new plant at Carbon City, Kentucky, is completed, these products are available in quantities up to tank cars from the GAF pilot plant and warehouses at Linden, N. J.

GENERAL ANILINE & FILM CORPORATION

COMMERCIAL DEVELOPMENT DEPARTMENT

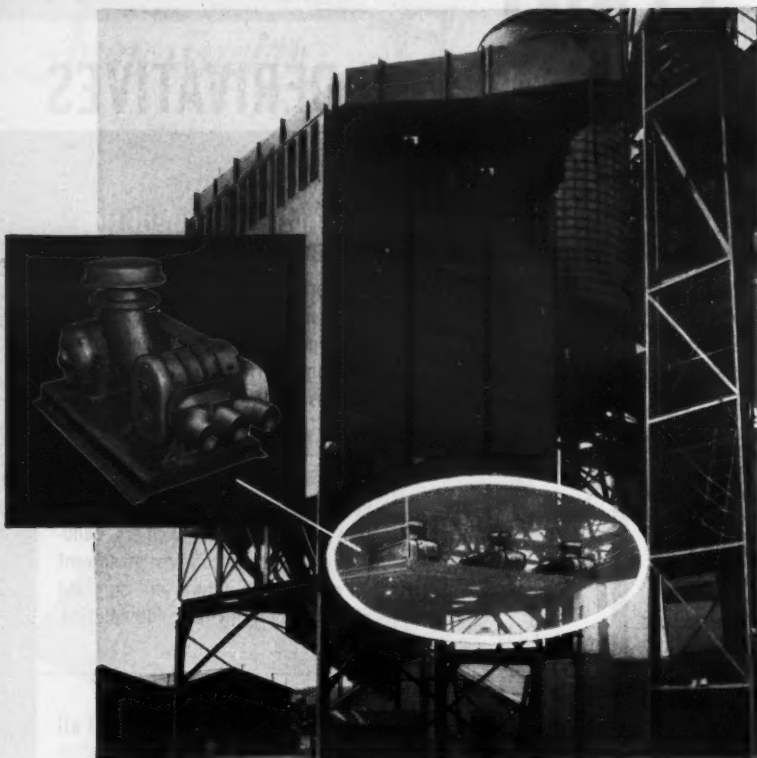
435 HUDSON STREET, NEW YORK 14, N. Y.

gaf

*From Research to Reality*

# MIEHLE-DEXTER BLOWERS

*eliminate* filter clogging,  
caking, shaking and disposal



## HOW PRECIPITATOR COSTS ARE REDUCED FOR GRAVEL AND ASPHALT PLANT

The nation's growing battle against air pollution focuses attention on the need for modern precipitator equipment. Manufacturers like Western Precipitation Corp. have learned how Miehle-Dexter Positive Displacement Blowers help assure smoke and dust abatement.

For instance, on this Detroit, Michigan installation, located at a gravel and asphalt plant, three belt-driven M-D Blowers provide pressure air for cleaning the filters. Old-fashioned methods of shaking filters clean are eliminated. What's more, there is no clogging or caking of filters... no need for washing them. Costs of operating and maintaining this equipment are reduced.

Miehle-Dexter Blowers save weight and space, require little or no maintenance. *Capacities available:* 50-4000 c.f.m. or multiples thereof with single-drive arrangements. *Discharge pressure:* to 14 p.s.i.g. *Vacuum:* to 15" h.g.

If you have a product or process requiring dependable movement of air or gas, call on Miehle-Dexter. Our engineers will work with you... demonstrate how Miehle-Dexter Blowers can simplify operation and reduce costs for you. Write for new Bulletin No. 255.



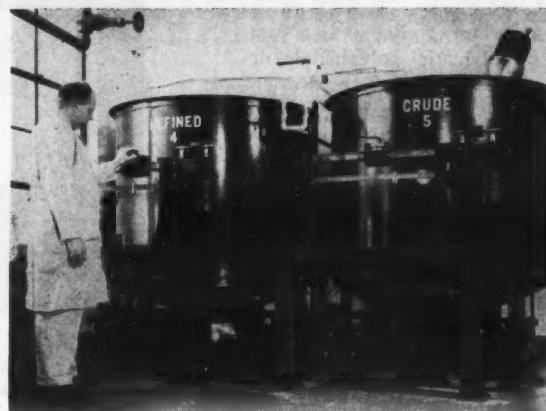
## MIEHLE-DEXTER SUPERCHARGER

Division of the Dexter Folder Company  
101 Fourth Street Racine, Wisconsin

When inquiring check CP 5606 opposite last page

ideas — from other industries and the AEC...  
new trends in research, processes, services

**Commercial-size demonstration refinery for edible oils replaces pilot plant for studying best-suited of five commercial methods — permits processor to**



All input material, and all products of refining are collected in these and other weigh tanks located throughout the refining processes

## choose optimum oil refining process through full-scale material balance data

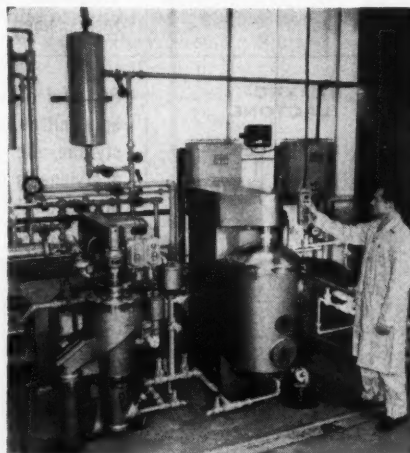
Crude vegetable oils contain approximately 3% waste residue, and present refining loss is about 5%. Thus, methods for recovering this 40% oil loss are of major economic consideration to processors. Coupled with the problem of increased oil recovery is that of disposal of

waste products—the method of refining materially affects the character of the waste, making one process feasible under the conditions of a specific processor, while the same process would be unusable under the requirements of another processor or location.

Better means to attack and solve such problems have been provided by the opening of a full-commercial scale demonstration refinery at Sharples Co., Philadelphia. A processor can ship crude oil to the plant, have it refined on commercial-sized equipment and receive a complete material balance on all products and waste materials.

All incoming material, including the oil, added caustic, ammonia, water, etc., is weighed in weigh tanks before processing, and product fractions are collected in weigh tanks at significant points in the system.

Equipment is so arranged that any of five processes used commercially (caustic, modified caustic, soda ash, modified soda ash, or ammonia) can be run. Demonstration refinery uses regular plant-sized processing and proportioning equipment, tanks, piping, instrumentation, etc. Thus, no extrapolation is necessary to scale up



Operator starts continuous centrifuge (full plant size) used in separating residues which are precipitated by any one of the five refining processes



Oil analyses can be quickly determined in analytical lab adjacent to demonstration refinery

the chosen process to desired capacity—this is accomplished by adding more units in parallel.

The new demonstration refinery, which has a capacity of one tank car (60,000 lb) per day, furthers the goal of research for individual processors. Refinery occupies 15,000 square feet on three floors. Accurate comparisons can be made between processes, and variations of treatment under individual processes can be assessed.

(Demonstration refinery for edible oils is a development of The Sharples Corp., Dept. CP, 2300 Westmoreland St., Philadelphia, Pa. . . . or for more information check CP 5607 opposite last page.)

#### Simple epoxidation process promises new markets for fats, oils

Simple and economical "in-situ" epoxidation process promises vast new markets for agricultural fats and oils. Based on use of a controlled molar ratio of acetic acid to hydrogen peroxide in presence of strong mineral acid catalyst at elevated temperatures, process yields vinyl plasticizers from farm crop derivatives.

Some of catalysts employed include sulfuric acid, alkane sulfonic acids, and sulfonic acid ion-exchange resins. Resins can be reused after filtration. Use of solvents has been found beneficial in some cases. The strong acid catalyzes formation of peracid in reactor. Simultaneously, the peracetic acid formed reacts with unsaturated compound. Net effect is total consumption of hydrogen peroxide and formation of an epoxy derivative. No prior preparation of peracid is necessary; hydrogen peroxide is the oxidant added to reactor.

Generally, in epoxidation of unsaturated esters of monohydric and polyhydric alcohols or triglycerides, 70 to 90% conversions to corresponding epoxy ester have been obtained.

(Process is development of Buffalo Electro-Chemical Co., Inc., Div. of Food Machinery and Chemical Corp., Dept. CP, 34 Sawyer Ave., Buffalo 7, N.Y.)

# Find the Newest Answer to CORROSION CONTROL

## in this 20-page **KEL-F®** Dispersions Manual

Learn how you can get the advantages of KEL-F fluorocarbon plastic: corrosion and heat resistance, anti-adhesion, abrasive resistance, excellent electrical properties, moisture resistance *in a dispersion coating, for application by spraying, dipping or spreading*



® Registered trademark of The M. W. Kellogg Company's fluorocarbon polymers



**THE M. W. KELLOGG COMPANY**  
Chemical Manufacturing Division  
P. O. Box 469, Jersey City 3, N. J.

Please send me my copy of the new Kellogg Manual, "Application Techniques for KEL-F® Fluorocarbon Polymer Dispersions."

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

#### I am interested in Dispersion Coating Applications for:

- |  |  |
|--|--|
| <input type="checkbox"/> trailer tanks       | <input type="checkbox"/> calendering rolls         |
| <input type="checkbox"/> tankcars            | <input type="checkbox"/> forming dies              |
| <input type="checkbox"/> storage tanks       | <input type="checkbox"/> guide rolls               |
| <input type="checkbox"/> pipe lines          | <input type="checkbox"/> mattress molds            |
| <input type="checkbox"/> pumps               | <input type="checkbox"/> tire molds                |
| <input type="checkbox"/> mixers              | <input type="checkbox"/> ribbon blenders           |
| <input type="checkbox"/> valves              | <input type="checkbox"/> cone blenders             |
| <input type="checkbox"/> flowmeters          | <input type="checkbox"/> hoppers                   |
| <input type="checkbox"/> reactors            | <input type="checkbox"/> casting molds             |
| <input type="checkbox"/> shipping containers | <input type="checkbox"/> coated glass tape         |
| <input type="checkbox"/> waste neutralizers  | <input type="checkbox"/> miniaturized stators      |
| <input type="checkbox"/> agitators           | <input type="checkbox"/> distribution transformers |
|  | <input type="checkbox"/> miniaturized relays       |

Other applications (please list) \_\_\_\_\_

When inquiring check CP 5608 opposite last page

# Carried 18,000,000 tons ...26 years in a cement mill

## It's a Link-Belt SS-856 steel chain

If your requirements demand a long-lived elevator chain, use Link-Belt SS-856. This 6-in. pitch chain is made of high carbon steel sidebars with nickel alloy pins and bushings. Its average ultimate strength is 100,000 lbs. Other Link-Belt elevator chains, with ultimate strengths up to 200,000 lbs., are also available.

Link-Belt SS-856 is another example of Link-Belt's ability to apply the chain best suited to a specific set of conditions. No other single source offers you such a broad range of chains and sprockets... roller, silent, cast, combination, forged and fabricated steel types.

A call to your nearby Link-Belt office or authorized stock-carrying distributor will bring you all the facts about the complete line of Link-Belt chains and sprockets.

This Link-Belt SS-856 steel chain at a Pennsylvania cement mill was still serviceable after handling 18,000,000 tons of raw materials in 26 years. Those are Link-Belt cast buckets, too.



## LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

### IDEAS

#### Over \$1 million per year spent by Procter and Gamble on odor control . . .

patrols tour surrounding residential areas to check efficiency of company's methods

Over one million dollars a year has been spent by The Procter and Gamble Company during past nine years to control annoying odors emanating from its plants. Due to general lack of knowledge in the field of odor control and measurement, much of work has been of a pioneering nature.

Control methods employed by company consist of changing operating techniques, revamping manufacturing processes, installing special control equipment, and dissipating odors through use of specifically designed stacks.

Odor patrols tour surrounding residential areas to check efficiency of company's methods. Patrol personnel have authority to shut down a department if they believe it is necessary in their task of tracing down and eliminating odors.

One of the early problems encountered was lack of any quantitative concept of odor. Since odors can be detected only by physiological sense of smell, it seemed logical to relate odor quantity in some way to the sense of smell. This was done by establishing an "odor unit" as amount of odor (regardless of origin) necessary to contaminate one cubic foot of air to the threshold point.

To make use of quantitative concept required a suitable threshold dilution technique for measuring odor concentration. Sampling system was devised which consisted of a continuous flow of 10-20 cfm odor-free reference air into which increasing amounts of odorous sample are introduced until odor is detected in exit mixture. Ratio of total diluted flow rate to sample flow is measured, and is the odor concentration of sample, in odor units per cubic foot.

Device has been used for measurement of plant odor discharges, for determining efficiency of various odor removal equipment, and in laboratory and pilot plant studies. Apparatus has also helped in design of odor scrubbers and furnaces, and to determine optimum operating conditions for equipment.

Example of latter involved operation of odor furnaces. Units were operating at 1000°F exhaust temperature in belief that this destroyed the odorous material by oxidation. Tests showed that odors could be reduced further by operating furnaces between 400-450°F. Annual fuel savings amounted to about \$50,000, evidence that the research had been valuable.

(Information on research concerning odor control is presented through the courtesy of The Procter and Gamble Company, Department CP, Gwyne Building, Cincinnati 1, Ohio.)

### Introduce nitric acid process for making pulp . . .

requires no heat, steam, or complicated equipment in operation

Nitric acid process for making paper pulp is reported to cut plant investment up to 60% and production costs by 20%. Developed in France, the process offers possibility of making pulp from raw materials heretofore of little use or considered as waste. Method requires no complicated machinery, no steaming or heating, no refining, no soda recovery. It causes no water pollution problems.

Process does not attack the cellulose, thus the natural length of fibers is preserved. Wood does not have to be barked. Process can use any kind and size of wood, including branches and brushwood. Method is also applicable to all sorts of vegetable fibers, such as straw, bagasse, cotton brush, etc.

Process consists essentially of nitrating the raw material with 30° Baume nitric acid solution (at about 60°F), separating treated material from the acid, and treating this product with a 0.5-5.0% caustic solution at about 98°F. Practically all material is said to be converted to cellulose pulp. Solutions may be reused. Inasmuch as reactions are all exothermic, no heat is needed, and refrigeration is required only to prevent temperature of nitric acid from rising unduly.

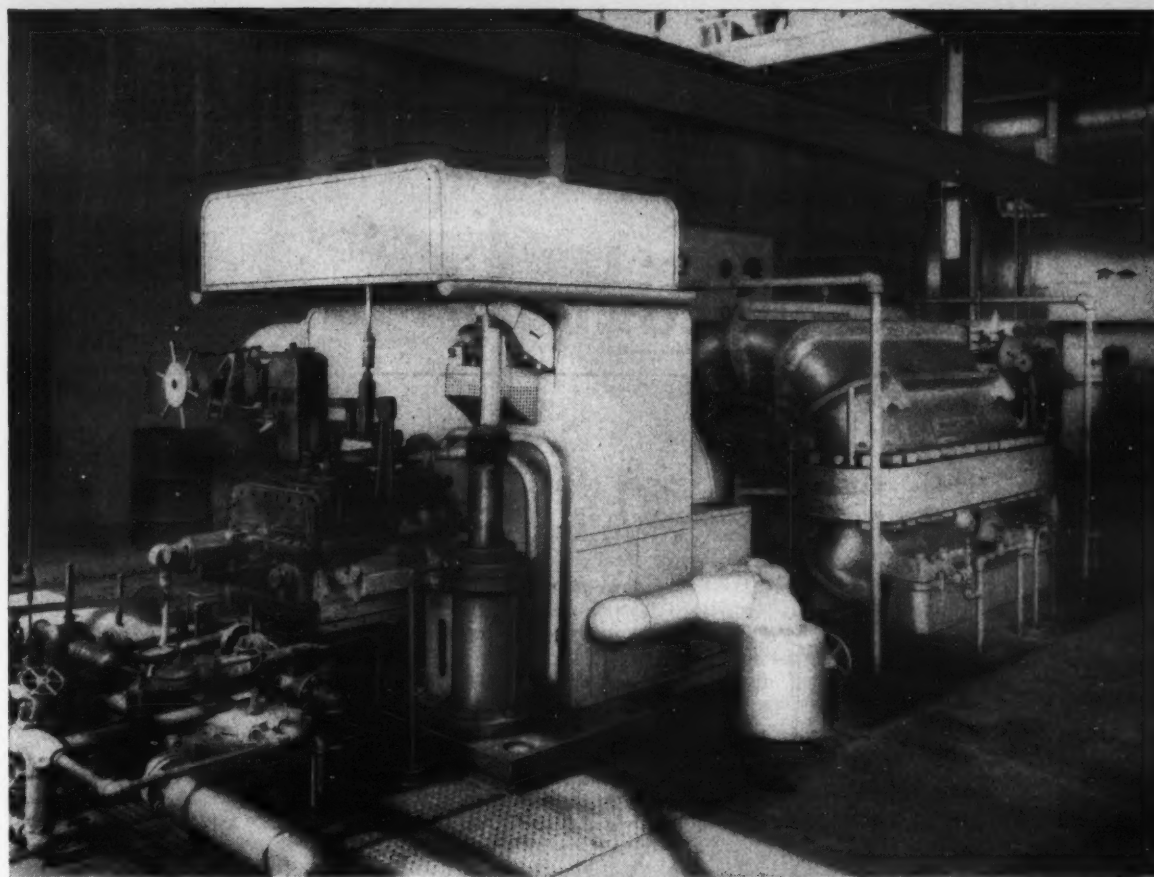
Plant equipment is made up of standard units, each having production capacity of 5 to 10 tons per day, depending on raw material used. Process gives opportunity of starting with small plant, and expanding into large one simply by adding additional units. First industrial plant is under construction in France. It will produce 20 tons of pulp per day from straw.

(Delbay Process is handled in US by Council on Public Relations, Inc., Dept. CP, 366 Madison Ave., New York 17, N. Y.)

### Photographs highlight book on engineering services

Illustrated 32-page booklet lists and describes manufacturer's services in various fields of engineering. Recent projects involving installation of equipment are pictured. Included are paper mill and steel mill equipment, turbines, generators, furnaces, cranes, and other machinery. List of 44 users of manufacturer's services is also included.

Booklet is issued by Eichleay Corporation, Dept. CP, 33 S. 19th Street, Pittsburgh 3, Pa. When inquiring specify CP 5610 on handy form opposite last page.



SINCLAIR REFINING COMPANY'S plant in Houston, Texas, gets continuous, dependable driving power for their compressors from high-speed Worthington steam turbines. Other Worthington turbines at Sinclair drive centrifugal pumps.

## Worthington high-speed turbines drive compressors around the clock at Sinclair

Twenty-four hours a day, every day of the year. That's the kind of service the Sinclair Refining Company expects — and gets — from their high-speed Worthington turbines.

These Worthingtons have been on stream since 1953, driving centrifugal compressors which compress cracked gas coming from the reactor in a cat cracker.

Like Sinclair, other leading refineries and process plants have found that for continuous, high-speed

driving of compressors and blowers, Worthington turbines are the right choice.

Remember, the engineering of the drive is just as important as the engineering of the compressor or blower. Worthington's long experience in compressor-drive engineering is your assurance of getting the right type and size drive. Write today for Bulletin 1966 to your nearest Worthington district office, or address Worthington Corporation, Harrison, New Jersey.

T.4.12

# WORTHINGTON



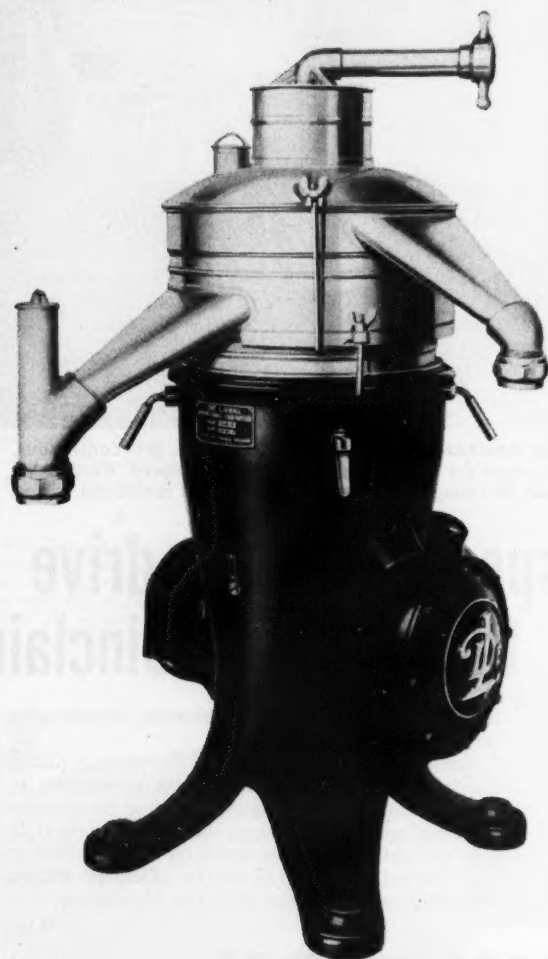
STEAM TURBINES

Single- and Multi-Stage Turbines • Turbine-Generators • Deaerators • Boiler Feed Pumps • Surface Condensers

A GREAT TEAM IN STEAM

When inquiring check CP 5611 opposite last page

## TIME SAVING... PLUS!



Naturally De Laval Centrifugals save time in chemical and food processing ...because they eliminate old-fashioned "stop-and-go" filters or settling tanks...provide new efficiency, economy and profit!

But that isn't all! De Laval Centrifugals also improve the chemical or food product being processed ...by doing a better separating job!

If you do liquid-liquid, liquid-solid or liquid-solid-liquid separating...ask us to tell you exactly how De Laval Centrifugals save time—and money ...and do a better separating job ...for leading chemical and food producers!



# DE LAVAL

for faster processing systems

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 61 Beale St., San Francisco 5

When inquiring check CP 5612 opposite last page

## IDEAS

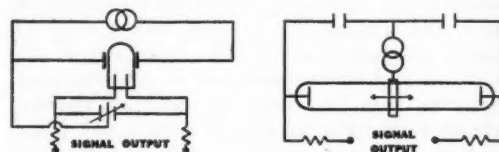
### Put "neon bulb" to work as sensitive linear transducer . . .

measure displacement in microinches, pressure in microns, other variables

Using special gas-filled tubes, researchers have built a number of transducers capable of sensing small displacements, motions, and accelerations. Though tubes are specially built for this use, neon bulbs or even ordinary fluorescent lighting tubes can be used. Special tubes are far more sensitive, can be arranged to produce more linear signals, and can be easily used in special applications.

Typical specifications for a comparator micrometer show that one millionth of an inch per meter division can be achieved with good stability. Similar sensitivity makes it possible to measure pressure in microns of mercury.

Actual output of these devices is a DC voltage. Glow discharge tube is placed in a high (typically 400 kc) frequency field between two capacitor plates.



Schematic of two forms of glow discharge transducer

When this field is symmetrical about electrodes in the glow tube no voltage appears across these electrodes. Any shift in the field (physically by moving tube or plates, or electrically by circuit manipulation) results in a *direct current voltage* at the electrodes. Voltage can be several hundred volts if voltage supplied to field is slightly higher. In best circuits sensitivity to position is two volts per 1/1000 millimeter — 2000 v/mm.

Since, in its present form, this is a high impedance device, circuit only loads RF field to about 50 milliwatts. With this small power requirement, a one-tube oscillator producing 500 volt (peak-to-peak) RF suffices.

Because of newness of this whole concept of measurement, engineering details have not been worked out for more than a few process control instruments. To speed up work on special designs, manufacturer makes a kit available for basic transducer. User can adapt this to special problem at hand if suitable glow discharge equipment is not specifically indicated.

(T-42 Glow Discharge Transducer is a development of Decker Aviation Corporation, Department CP, 1361 Frankford Avenue, Philadelphia 25, Pennsylvania . . . or for more information concerning manufacturer's product, reader may simply check CP 5613 on convenient Reader Service slip opposite last page.)

### Improve with ni

Improve and pla nickel b announce active said to chrome

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### Improved plate finish with nickel process

Improved control characteristics and plate finish are reported with nickel brightening process recently announced. Furnishing a highly active nickel deposit, process is said to be ideal for subsequent chrome plating.

Method permits high tolerances for impurities without impairing quality of finish. Leveling, hiding, and ductility are good. High throwing power (up to 100 amps/sq ft) permits uniform plate deposition into recesses. Present baths can be easily converted.

(Wabrite process is development of Wagner Brothers, Inc., Dept. CP, 400 Midland Avenue, Detroit 3, Michigan.)

### Tells how to train plant, supervisory personnel

Fourth in series on cost reduction for industrial plant management, 12-page booklet deals with various facets of training both plant and supervisory personnel. All elements of a well-rounded training program are included. Such subjects as when to train, who should be trained, what to teach, and who should do the training are all explained in detail.

One chapter outlines various steps in training program, viz: preparation, presentation, application, and follow-up. Suggested check sheet of job analysis in relation to employee, what he has to be able to do, and what he has to know to do it, is also included in booklet.

"How to Train" is issued by Wheeler Associates, Inc., Dept. CP, 13017 Detroit Avenue, Cleveland 7, Ohio. When inquiring specify CP 5614 on handy form opposite last page.

For more information on product at right, specify CP 5615 . . . see information request blank opposite last page.



## Enough heat to scorch an ordinary motor winding

When sudden high heat sears ordinary motor windings too often, the electrical insulation gives out . . . the windings short-circuit and production stops.

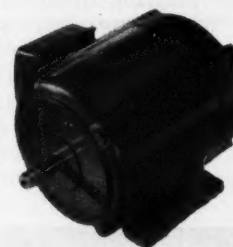
This damaging heat is caused on many motor applications by unexpected, temporary, high load demands. Such peak loads can produce gradual insulation decay in ordinary motors or cause rapid, destructive burnouts. Life-Line® "A" motors lick this problem with a new fortified insulation system.

*First*, the Life-Line "A" motor coils are wound with copper wire specially protected by BONDAR, a new heat-resistant, synthetic resin. *Second*, each slot cell is made with MYLAR\* polyester film and is bonded to a reinforcing base. *Third*, the completely wound stator is given multiple dips and bakes in BONDITE, a silicone-reinforced thermoset varnish that has outstanding resistance to water, oil and chemicals. The result is an insulation system that provides longer motor life and fewer application restrictions.

It's another example of the way operating and maintenance costs are lowered by major improvements in motor design and performance pioneered by Westinghouse.

\*Du Pont Registered Trade-Mark

**Life-Line A**



YOU CAN BE SURE...IF IT'S  
**Westinghouse**



J-21723-A

INCREASED PHOTO OF MOTOR WINDING ABOVE  
INSULATION HAS BURNED DOWN DUE TO OVERHEATING

**Tells aims, objectives  
of tape council**

Facts and information about organization working at job of standardizing nomenclature and test methods within pressure-sensitive tape industry are given in four-page brochure.

Brochure is issued by Pressure Sensitive Tape Council, Dept. CP, 530 Echo Lane, Glenview, Illinois. Specify CP 5616 opposite last page.

**Calculator designed to help  
find best operating conditions  
for oil refinery . . .**

can add, subtract 500 ten-digit numbers a second

Electronic digital computer being installed at Socony-Vacuum's research and development laboratories, Paulsboro, N. J., will be put to work to determine best operating conditions for the refinery. Calculator is believed to be largest and fastest installed by any oil company.

To conduct program, laboratory scientists have constructed a mathematical model of the refinery, using numbers and formulae to represent processing units. Model consists essentially of a group of about 100 equations which express mathematically the



Electronic computer at oil company can remember more than 4000 ten-digit numbers

behavior of catalytic cracking, reforming, and other processing units at the Paulsboro refinery. Equations are punched on cards, which are read by the computer and stored in its memory.

# Why Rockwell-Nordstrom Cost Less to Use in ANY

## Corrosion control, longer life:

In Rockwell-Nordstrom valves, *the seat is never exposed to corrosive or erosive line materials.* And at all times the plug is surrounded by a tough film of pressurized lubricant to provide:

—a protective coating between plug and body that prevents grinding wear, means longer valve life and easier operation.

—a far tighter seal than is possible with ordinary metal-to-metal closure. Holds lightest gases or heaviest fluids.

—lubricant, forced into a chamber at the small end of the plug, serves as a hydraulic jack, insuring continuous, dependable operation.

And Rockwell-Nordstrom simple quarter turn closure makes power, gear, or wrench operation two to five times faster than ordinary valves. Ideally suited for automation.

## Genuine Rockwell-Nordstrom lubricants:

There are genuine Rockwell-Nordstrom lubricants to meet almost any combination of pressure, temperature and line fluid conditions. They are the result of the longest and most extensive research into valve lubricants ever made by any company. Their purpose is to help Rockwell-Nordstrom—the *original* lubricated plug valve—give you the best valve service you have ever had, *at the lowest yearly cost.*

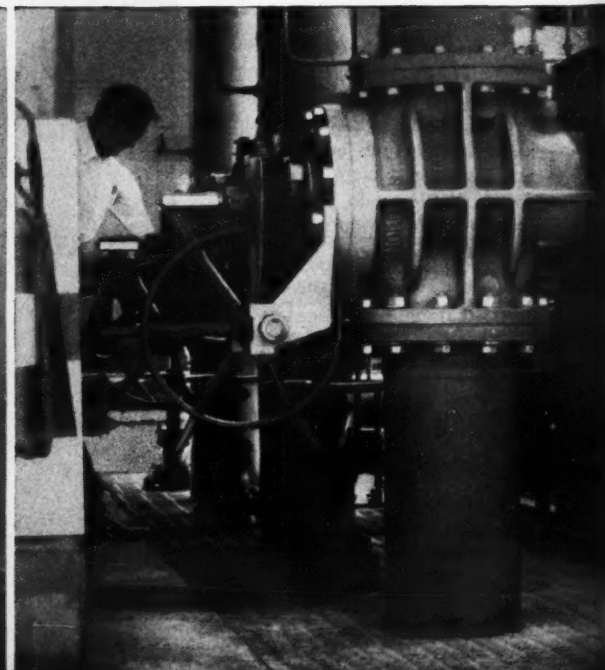
## What are your valve problems?

Rockwell-Nordstrom valves are made in a wide range of sizes, pressures, special metals and body designs for chemical and process applications. Your Rockwell-Nordstrom Sales Engineer can help you specify the right valve and lubricant combination for your needs. Or write: Rockwell Manufacturing Company, Pittsburgh 8, Pa.

Wrench operated Rockwell-Nordstroms on these latex tank blow-down lines provide leak proof control under constant operation that would soon ruin ordinary valves.



These Rockwell-Nordstrom gear operated valves assure fast, dependable control on dry hydrogen supply lines at a big ammonia plant.

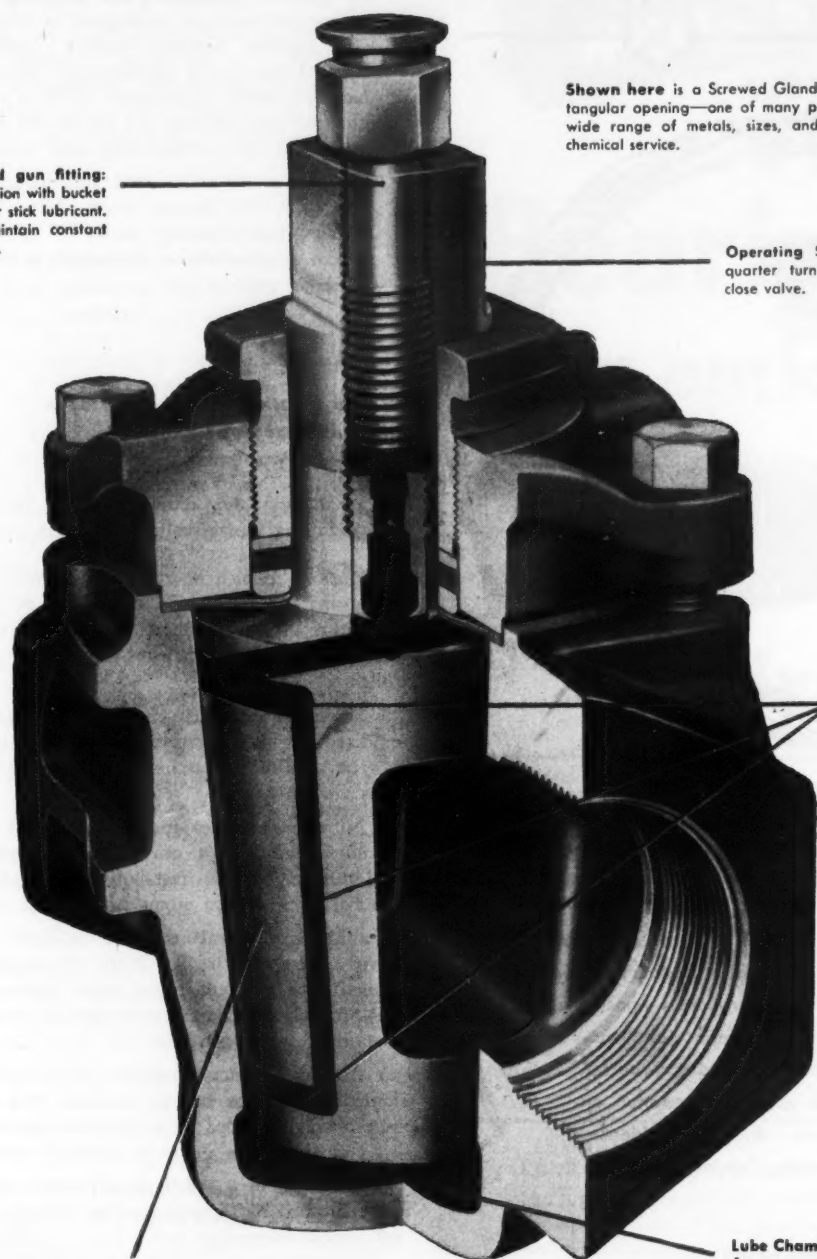


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# Lubricated Valves

## Chemical Process Service



**Lube Screw and gun fitting:**  
Easy, fast lubrication with bucket gun, hand gun, or stick lubricant. Check valves maintain constant lubricant pressure.

Shown here is a Screwed Gland steel valve with rectangular opening—one of many patterns available in a wide range of metals, sizes, and pressure ratings for chemical service.

**Operating Shank:** Quick quarter turn to open or close valve.

**Lube Channels:** "Sealport" lubricant system assures perfect seal. Lubricant eliminates metal-to-metal friction.

**Tapered Plug:** Maximum strength, positive seating, perfect sealing.

**Lube Chamber:** Jack plug for easy operation, if necessary. No stuck or galled valve down-time.

## ROCKWELL-Nordstrom VALVES

LUBRICANT SEALED FOR POSITIVE SHUT-OFF



IDEAS

Punch-cards containing other data, operating conditions, and requirements are also fed into the machine. Computer handles factors in proper way and comes up with answers in as little as 15 minutes. To perform computations with hand calculators would require simultaneous operations of 250 to 300 of the units.

Machine can solve problems in algebra, calculus, or logic. It can add or subtract 500 ten-digit numbers a second, multiply 120 a second, and divide 85 a second.

Computer will remember more than 4000 ten-digit numbers. Unit can make choices or decisions based on results of calculations. Similar machine will be installed at field research laboratories in Dallas, Texas.

(Computers are manufactured by ElectroData Corporation, Dept. CP, 717 N. Lake Ave., Pasadena, California . . . or for more information check CP 5617 opposite last page.)

THURSDAY

| MARCH |    |    |    |    |    |    |
|-------|----|----|----|----|----|----|
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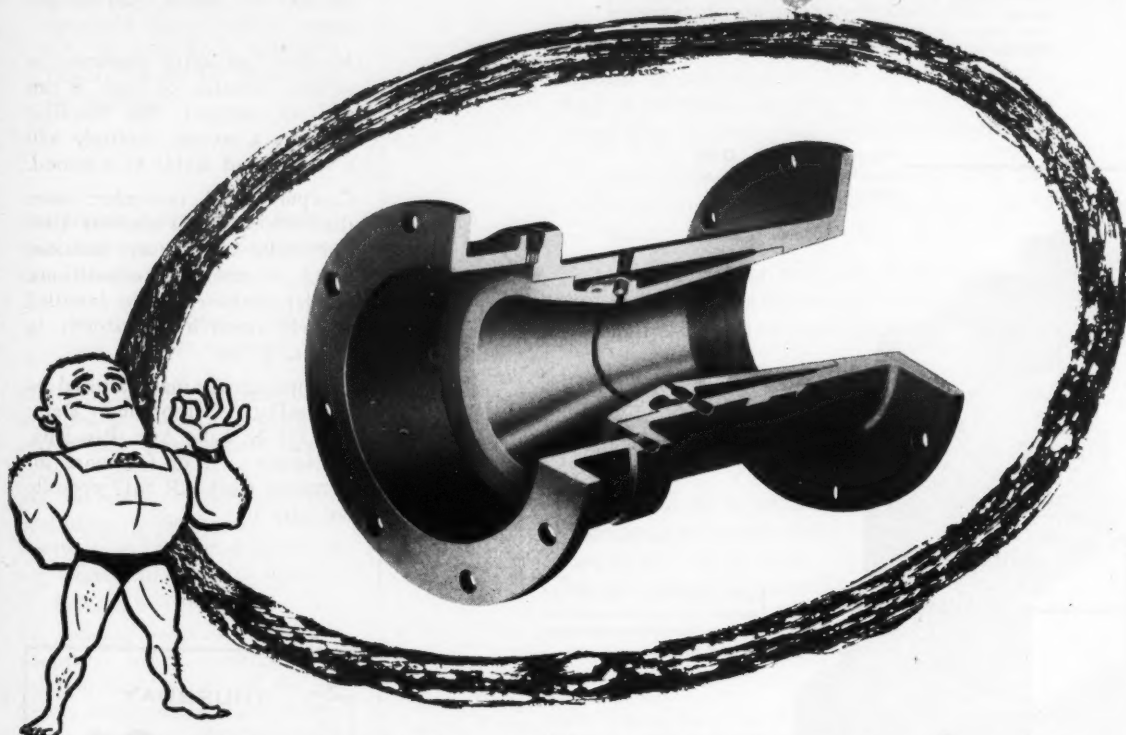
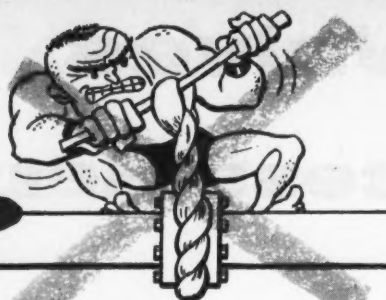
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MAR. 1955

*See listing  
of new chemicals  
in April "Chemical Processing"  
- may answer our  
process problem*

For more information on product at left, specify CP 5618 . . . see information request blank opposite last page.

# why pay for flow strangulation?



## Builders Dall Flow Tube reduces meter head loss where it counts...at the pipe line!

Here's what you can gain by replacing orifice plates with Dall Flow Tubes in your pipe lines: You reduce pumping costs. You avoid the expense of purchasing over-sized pumping equipment. You gain adequate process flows without building new and costly piping layouts. With it, you obtain top repeatability, long life.

Builders Dall Flow Tube gives maximum pressure recovery — more than any other velocity increasing flow tube. It's compact and economical, too. For complete details, write for Bulletin 115-L1. Also ask for information on secondary instruments. Builders-Providence, Inc., 387 Harris Avenue, Providence 1, R. I.



### BUILDERS-PROVIDENCE

DIVISION OF B-I-F INDUSTRIES, INC. METERS  
BUILDERS IRON FOUNDRY • PROPORTIONERS, INC. • OMEGA MACHINE CO. FEEDERS  
CONTROLS

When inquiring check CP 5619 opposite last page

#### IDEAS

##### **Lists German research reports, patents on synthetic rubber**

Translations of research reports and patent applications of new German processes for producing synthetic elastomers and adapting them to various end uses are catalogued in 10-page bulletin. Entitled "Synthetic Rubber", booklet gives titles, abstracts, and bibliographic data on more than two dozen translations. Bulletin is divided into two main sections, 1) production and properties, and 2) compounding and processing.

Bul 92 is issued by Research Information Service, Dept. CP, 53 Nassau Street, New York 38, N. Y. When inquiring specify CP 5620 on convenient Reader Service slip which is located opposite last page.

##### **Waste treatment study discloses difficult organics oxidized by microorganisms . . .**

secondary and tertiary amines, acrylonitrile, diamines, polyglycols, and others studied

Conclusions reached in study to determine if microorganisms and associated enzymes can be developed to oxidize organic chemicals difficult to handle with unacclimated microorganisms from sewage are as follows:

- 1) Secondary or tertiary amines and diamines not oxidized by microorganisms from domestic sewage can be oxidized by acclimated microorganisms and associated enzymes.
- 2) Nitrogen balances for the biological oxidation of amines indicate that availability of nitrogen in the molecule for bacterial metabolism is proportional to number of hydrogen atoms on nitrogen atom.
- 3) Organic chemicals that are oxidized slowly or have a persistent lag in BOD development when seeded with microorganisms from domestic sewage can probably be oxidized more rapidly through acclimation of microorganisms.
- 4) Acclimated microorganisms readily oxidize acrylonitrile. Nitrogen balance indicates that oxidation is probably preceded by an enzyme-catalyzed hydrolysis of the nitrile group to carboxyl group.
- 5) Oxidation of  $\alpha,\omega$ -dialkoxypolyethylene glycols can probably best be accomplished by acclimated cultures of aerobic microorganisms.
- 6) Oxidation of polyglycols was not accomplished aerobically, but can be done with an acclimated culture of anaerobic microorganisms.

Data obtained show that BOD determination may, at times, be as much dependent on culture of microorganisms as any other factor. Where BOD values for organic materials that are not readily biologically

oxidized are concerned, the data are valueless unless source and degree of acclimation of seed culture are known.

Tests were conducted with Kanawha River water — samples being taken about 20 miles downstream from South Charleston, West Virginia.

(Summary of paper presented at Ninth Industrial Waste Conference, by Messrs E. J. Mills, Jr. and Vernon T. Slack, Jr., Process Development Laboratory, Carbide and Carbon Chemicals Company, Dept. CP, South Charleston, West Virginia.)

**Reforming processes produce H<sub>2</sub>, olefins from gaseous, liquid petroleum fractions . . .**

utilize vertical alloy tubes in furnaces operating at high temperatures

Hydrogen and olefin reforming processes, developed by Hercules Powder Company and utilizing alloy tubes set vertically in furnaces operating at high temperatures, have been proved feasible and practical in full scale pilot plant operations.

For production of hydrogen, natural gas or propane mixed with steam is passed through a catalyst in the tubes and reformed to a mixture of carbon monoxide and hydrogen. Mixture is processed through a shift converter to produce carbon dioxide and hydrogen. Recent improvements in method make possible production of hydrogen from liquid petroleum fractions.

Olefin process uses similar apparatus and converts gaseous or liquid petroleum materials to mixture of ethylene, propylene, and other products. In conversion of East Texas crude, high yields of ethylene are obtained in a single pass. Separation of the olefins can be achieved through cryogenic methods or by absorption processes.

(Hydrogen and olefin reforming processes are available from Chemical Plants Division, Blaw-Knox Company, Dept. CP, Farmers Bank Building, Pittsburgh 30, Pa. . . . or for more information check CP 5621 opposite last page.)

**Put your finger on ideas**

. . . materials, equipment, and services through our handy Product Directory, starting in this issue on page 201. This "quick-locator" lists all products, with page references.

**ALLIS-CHALMERS  
Totally-Enclosed  
Fan-Cooled  
MOTORS**

**This  
Bearing,  
fully enclosed  
and protected,**

**yet easy to grease when desired  
... gives more value for your  
motor dollar**

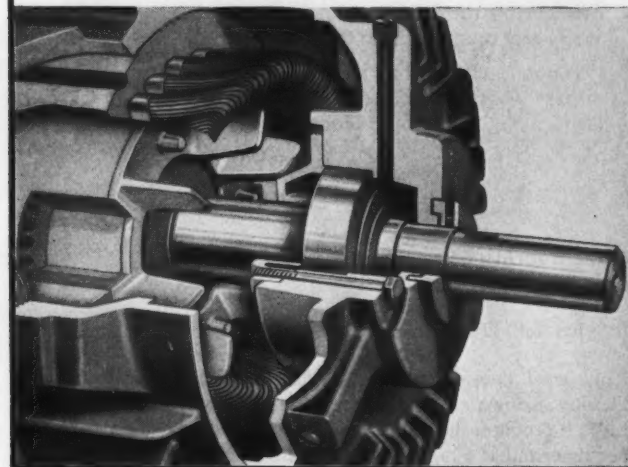
Lubricate without dismantling motor. Pipe-tapped holes in the bearing housings at two points provide both means for inserting new grease and a means of flushing out old grease.



Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225.

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.



**ALLIS-CHALMERS**



A-4575

When inquiring check CP 5622 opposite last page

### Book discusses economic aspects of pharmaceutical industry

Summary of several comprehensive studies made in field of pharmaceuticals is basis of 18-page booklet covering economic aspects of pharmaceutical industry. Remarkable growth of the business during the last 15 years is reviewed, plus the factors contributing to this.

"Economic Aspects of the Pharmaceutical Industry" is issued by R. S. Aries & Associates, Dept. CP, 270 Park Avenue, New York 17, N. Y. Specify CP 5623 opposite last page.

### More fluorine at lower cost with improved cell . . .

has cell life double that of conventional units

Redesigned fluorine cell has boosted production of fluorine. Known as "medium-temperature electrolytic cell", it produces fluorine at lower cost, in less operating time, and at a higher rate. Cell life is double that of conventional units.

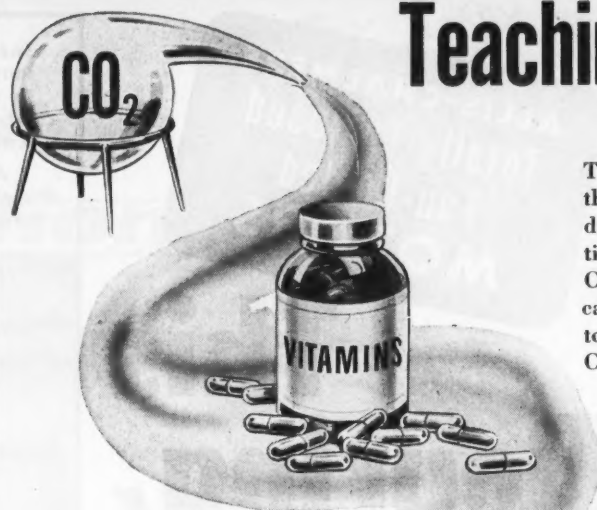
Construction was improved by use of stress-relieved nickel-base alloy inner shell, additional center cooling tubes, and a baffled water jacket. Additional effective anode area is obtained by using fewer but wider



Electrolyte sample is shown above being taken from improved fluorine cell

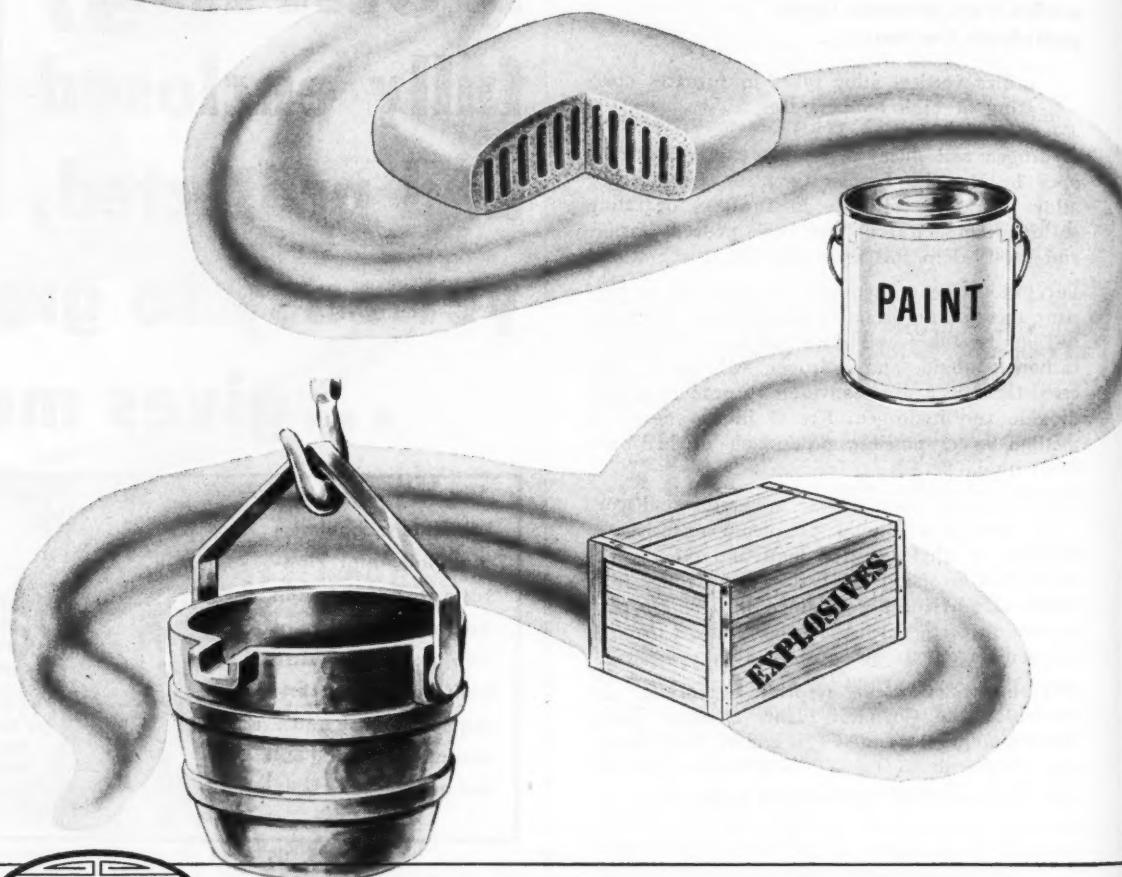
anodes. Anode support bars, pressure plates, and bolts are made of chrome-molybdenum steel. Head was altered to single unit with multiple gas outlets and welded Monel skirts.

By proper adjustment of anode to cathode spacing, as well as alignment, engineers were able to improve



# Teaching an Old Chemical

Today, chemical and processing industries are putting CO<sub>2</sub> through its paces . . . making it perform in imaginative and diverse ways — to the satisfaction of researchers and production men everywhere. Here are some applications in which CO<sub>2</sub> emerges with flying colors. If they suggest related applications in your processing methods, then we would be pleased to discuss them with you. Our wide experience in applying CO<sub>2</sub> to industrial problems is at your disposal.



## Pure Carbonic Company

Nation-wide "Dry-Ice" Service-Distributing Stations in Principal Cities

GENERAL OFFICES: 60 EAST 42ND STREET, NEW YORK 17, NEW YORK

PURE CARBONIC COMPANY is a division of AIR REDUCTION COMPANY, INCORPORATED Principal products of other divisions include: AIRCO — industrial gases, welding and cutting equipment and acetylenic chemicals OHIO — medical gases and hospital equipment NATIONAL CARBIDE — pipeline acetylene and calcium carbide COLTON CHEMICAL COMPANY — polyvinyl acetates, alcohols and other synthetic resins.

AT THE FRONTIERS OF PROGRESS YOU'LL

When inquiring check CP 5624 opposite last page

# New Tricks

## CO<sub>2</sub> as an Inert Gas for

Pharmaceuticals  
Dyes  
Paint  
Lacquer  
Packaging  
Purging Tanks and Mains  
Inert Pressure Transfer  
Fumigant Carrier  
Capsulating  
Explosives  
Powdering  
Flushing Molten Metals

## CO<sub>2</sub> as a Refrigerant for

Pharmaceuticals  
Dyes  
Paint  
Plastics  
Lacquer  
Insecticides  
Resins  
Rubber Trimming  
Vacuum Traps  
Low Temperature Testing  
Explosives  
Lyophilizing (low temperature drying)

## CO<sub>2</sub> as an Active Ingredient for

Pharmaceuticals  
Tin Plate Testing  
Asbestos Cement Cure  
Carbonation  
PH Control  
Foam Plastic  
Foam Rubber  
Water Treatment  
Manufacture of Carbonates



FIND

cell operation. Anode polarization has been minimized. Cell is normally operated at 8 to 10 volts and 3500 to 4000 amperes without interruption until breakdown. Current efficiency is about 90%. Temperature of electrolyte is kept between 200 and 220°F. Hydrogen fluoride concentration (in electrolyte) is kept at 41-42 per cent (by weight).

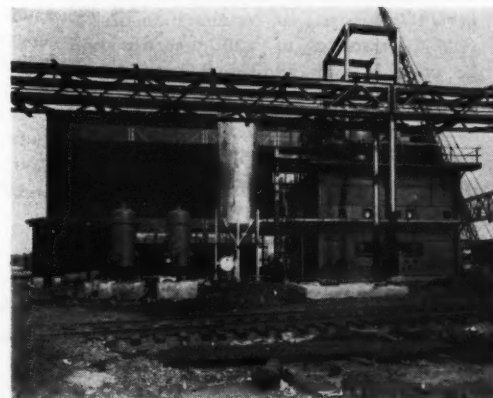
(Fluorine cell is development of Union Carbide and Carbon Corporation, Dept. CP, 30 East 42nd Street, New York 17, New York.)

### Expect 60% production boost with compounding system in plastics plant

Semi-continuous compounding system at General Electric Company's phenolic products plant, Pittsfield, Massachusetts, is expected to provide 60% increase in plant capacity. System was designed to meet needs of automatic molding techniques for high-density powders.

Safer working conditions for plant personnel have been effected through selection of special equipment. All electrical equipment is explosion-proof. General dust-collection system has been set up at all points of manual operation. Entire pneumatic conveying system is isolated with air locks. All fields of grinding equipment have rupture discs to vent any excessive pressures developed within machinery.

(Information courtesy of Chemical News Bureau, General Electric Company, Dept. CP, One Plastics Avenue, Pittsfield, Massachusetts.)



Large tonnage oxygen plant at Trenton, Michigan, is first in US to produce high-purity oxygen by Linde-Fraenkl process. Installation is owned by McLouth Steel Corporation and can also produce crude argon.

(Plant was constructed by Chemical Plants Division, Blaw-Knox Company, Dept. CP, Farmers Bank Building, Pittsburgh, Pennsylvania.)

## IDEAS

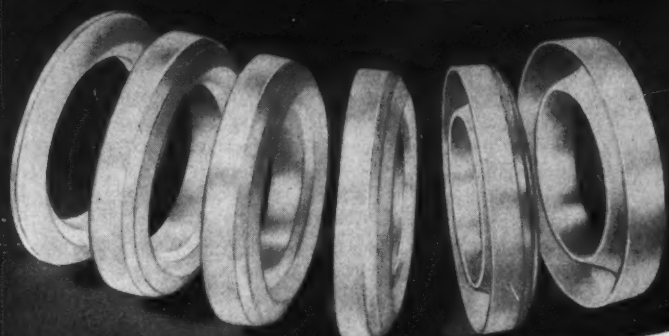
acids... gases... hot liquids...

## SOLVE YOUR SPECIAL PACKING PROBLEMS..

WITH JOHN CRANE

CHEMLON®

"C-V"  
RINGS



MADE OF  
Teflon\*<sup>U</sup>

## for CORROSION-FREE PACKING SERVICE IN PUMPS AND VALVES....

You can effectively handle any corrosive liquid or gas by re-packing your valves and pumps with "John Crane" Chemlon "C-V" Rings. Molded from the remarkable material, Teflon, "John Crane" Chemlon "C-V" Rings are impervious to almost every known chemical substance. They withstand extreme temperatures from -94° to +482°F—have extremely low friction coefficient. "Breakout" friction is only slightly higher than that of running friction. Special cross sectional design affords positive sealing at practically finger-tight gland pressure.

To bring you all the important advantages of Teflon for your particular sealing problem or application, "John Crane" has developed a complete line of Chemlon "C-V" Rings and male and female adapters. If you have special requirements, additional sizes can be molded to fit your stuffing box dimensions.

"John Crane's" illustrated booklet "The Best in Teflon" contains extensive information on a wide variety of Chemlon Products. Send for your free copy. Crane Packing Co., 1821 Cuyler Ave., Chicago 13, Ill.

In Canada: Crane Packing Co., Ltd.,  
617 Parkdale Ave., N., Hamilton, Ont.



\*DuPont's trademark

JOHN CRANE  
CRANE PACKING COMPANY

When inquiring check CP 5625 opposite last page

## How To Turn An ODOR IMP



## Into An ANGEL OF GOOD WILL

**DEODALL #1**, Sindar's new multi-purpose masking agent, replaces objectionable odors in varnishes, lacquers, cleaners, polishes, oils and other products with a fresh, clean scent that promotes sales, good will. Also solves stack odor problems effectively, economically. Ask Sindar for full facts.

**SINDAR** Corporation  
Industrial Aromatics and Chemicals

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Branches: Philadelphia • Boston • Cincinnati  
Detroit • Chicago • Seattle • Los Angeles • Toronto

When inquiring check CP 5626 opposite last page

## HAVING PUMP TROUBLES?

### In This Pump...



### ROCKWELL DIAPHRAGM PUMP

- ✓ The fluid does not contact moving parts, hence no corrosion or abrasion.
- ✓ No seals, packing glands or stuffing box to leak.
- ✓ No piston cups to wear and replace.
- ✓ No lubrication—bearings sealed for life.
- ✓ Easy to clean and maintain.

Fluid handling chamber is made of required corrosion- or abrasion-resistant metal or material. Suction lift to 25 ft.; discharge head to 150 ft. Write for Bulletin 700.

## W. S. ROCKWELL COMPANY

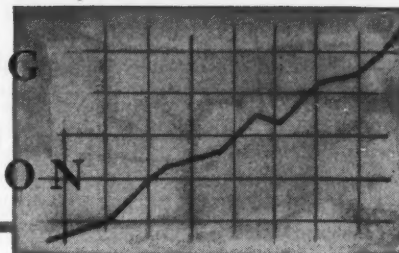
BUTTERFLY VALVES • SLIDE VALVES • AUTOMATIC VALVES

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Sales Representatives in Principal Cities

When inquiring check CP 5627 opposite last page

## EXPANDING CHEMICAL PRODUCTION



### Construction, production plans for NH<sub>3</sub> plant in Maine

Plans for a \$9 million nitrogen plant at Searsport, Maine — first in New England — have been announced by Northern Chemical Industries of Baltimore. The overall project—to be handled by The Girdler Co., Louisville, Ky.—includes a 125 ton/day anhydrous ammonia plant, 60 ton/day nitric acid plant, complete nitrogen solutions plant, and auxiliary units to supply steam, electric power.

Texaco process for production of ammonia synthesis gas from Bunker C fuel oil, by partial oxidation with oxygen, will be used in ammonia plant, with sea-water cooling wherever possible. Cycle will operate at 350 atmospheres.

Nitric acid plant will operate with ammonia oxidation process at approximately 100 psi, with 60 ton/day capacity of product (100% basis) at concentration of 55-60%. Expansion to 120 tons/day will be possible with additional apparatus.

Total output of nitric acid will be converted to ammonium nitrate solution by reaction with ammonia in proposed nitrogen solutions plant. Commercial grades of nitrogen solutions will be produced through use of additional ammonia.

Auxiliary units for steam and electric power will make plant self-sufficient.

### Uranium ore, mining departments formed by Vitro Corp.

Vitro Corporation of America has acquired an interest in 57 uranium claims in Fremont County, Wyoming. Company has formed an ore and mining department which will supervise exploration and drilling in prepa-

ration for mining of ore. In its other divisions Vitro Corporation is engaged in design and engineering of processing plants and technical facilities, particularly in the fields of atomic energy and newer elements in metals; chemical and physical research in development of processes, instruments and equipment systems; refining and recovery of rare metals, and manufacture of ceramic colors.

### New West Coast fertilizer plant to produce 500 tons daily

Stauffer Chemical Company is expanding fertilizer manufacturing facilities at Vernon and Richmond, California. First step in program costing over \$1 million will be taken at Vernon where a new plant will be built capable of producing approximately 500 tons per day of pelletized superphosphate and ammonium phosphate fertilizers. Plant will be located adjacent to the company's large fertilizer works at Vernon, will use process developed and designed by Stauffer. Completion and initial production of the Vernon addition is planned for mid-1955.

### Plant to make carbon black and dispersed pigments

Acheson Dispersed Pigments (Texas) Inc., subsidiary of Acheson Industries, chose Orange, Texas, as the site for new plant to supply polyethylene producers with dispersed pigments and carbon black. Carbon black, when added to polyethylene, confines photo-oxidation effects to surface layer, thereby minimizing principal cause of resin degradation.

News about chemical materials in the US —  
*plant construction, increased production . . .  
 on stream now or planned for future*

**USI opens \$7,000,000 NH<sub>3</sub> plant  
 at Tuscola, Illinois**

US Industrial Chemicals Co., a division of National Distillers Products Corp., marked completion of its \$7,000,000 ammonia plant with formal dedication recently at Tuscola, Illinois. The installation, which will produce synthetic ammonia and fertilizer nitrogen compounds, is adjacent to USI's sulfuric acid plant, on-stream since September, 1953. The combination thus supplies two important agricultural chemicals from single site. Both units function with National Petrochemicals Corp., a joint enterprise of National Distillers and Panhandle Eastern Pipeline Co. Panhandle supplies the natural gas as basic material for ethyl alcohol, ethyl ether, ethyl chloride, and polyethylene. By-product hydrogen from Petro is used in ammonia manufacture and also in ethyl chloride process. Spent sulfuric acid from alcohol unit returns to sulfuric acid plant, giving efficient production from Distillers' integrated geographic planning. Capacity of new plant will be 50,000 tons/year anhydrous ammonia.

**Complete Stauffer sulfur plant  
 at Monongahela, Pa.**

An \$800,000 plant for the production of Crystex, a form of sulfur, has been completed at Monongahela, Pa., for the Stauffer Chemical Co. Plant brings number of company's sulfur installations to eight.

Site was chosen because of proximity to the rubber industry, a major consumer of this allotropic form of sulfur.

Production of Crystex, developed by Stauffer, is based on continuous flow, converting rhombic sulfur to the allotropic form, which has different physical

and chemical properties. Company's process involves rapid chilling of molten sulfur in carbon disulfide, with separation of high-mw, insoluble polymerized allotropic sulfur. This form has found use in the rubber industry, because it remains inactive until proper curing is obtained.

**Du Pont plans more facilities  
 for polyisocyanates production**

Plans to construct additional facilities for manufacture of polyisocyanates at du Pont's Chambers Works in Deepwater Point, New Jersey, were disclosed by Organic Chemicals Dept. Design and construction work will be conducted by du Pont's Engineering Department. Target date for completion of entire project is middle of 1956.

**Hercules Powder expands facilities  
 for wet-strength resin output**

New production unit for the manufacture of wet-strength resins will be added to Hercules Powder Co.'s Holyoke, Mass., plant, with operation expected by April or May this year.

Wet-strength resins are used in towel-ing, bag papers, facial tissues and other specialty applications.

**Increase oil additive production  
 to 750,000 gal a month**

Oil additive and oil additive intermediary facilities at the Fords, N.J., plant of the Catalin Corp. of America have been expanded at a cost of approximately \$150,000. Company's expansion has increased its monthly output of oil additive to about 750,000 gal.

# You can solve your tough corrosion problems by using Bitumastic® Coatings

*they stop  
 corrosion  
 caused by*

**INDUSTRIAL  
 ATMOSPHERES**

**SALT AIR  
 HEAT  
 CORROSIVE SOIL  
 MOISTURE  
 ACID FUMES**

**INDUSTRIAL ATMOSPHERES** test the effectiveness of any protective coating. Bitumastic® Super-Service Black does an excellent job of protecting this structural steel. Cracks and corners that are hard to seal with ordinary paints are easily and thoroughly protected by this heavy-duty coating.

Tough corrosion problems can be solved, but not by using ordinary maintenance paints or conventional protective coatings. For long-term protection, it takes *specialized* Bitumastic Protective Coatings—the kind that Koppers makes.

Bitumastic Protective Coatings are specially formulated from a tar pitch base\* that is, for all practical purposes, impervious to moisture. These

\*Hi-Heat Gray is a non-coal-tar vehicle with metallic pigment

coatings keep moisture away from exposed metal surfaces . . . and that's the *best* way to stop corrosion.

Bitumastic Coatings are also extra-tough and extra-thick. Where other factors are equal, the *thicker* the coating the *longer* the period of protection.

Send for a set of free booklets describing the family of Bitumastic Protective Coatings. At the same time, tell us about *your* corrosion problem so that we can suggest a satisfactory solution. You incur no obligation, of course.

**KOPPERS COMPANY, INC.**

Tar Products Division, Dept. 379-T, Pittsburgh 19, Pennsylvania  
 DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK,  
 PITTSBURGH, AND WOODWARD, ALA.

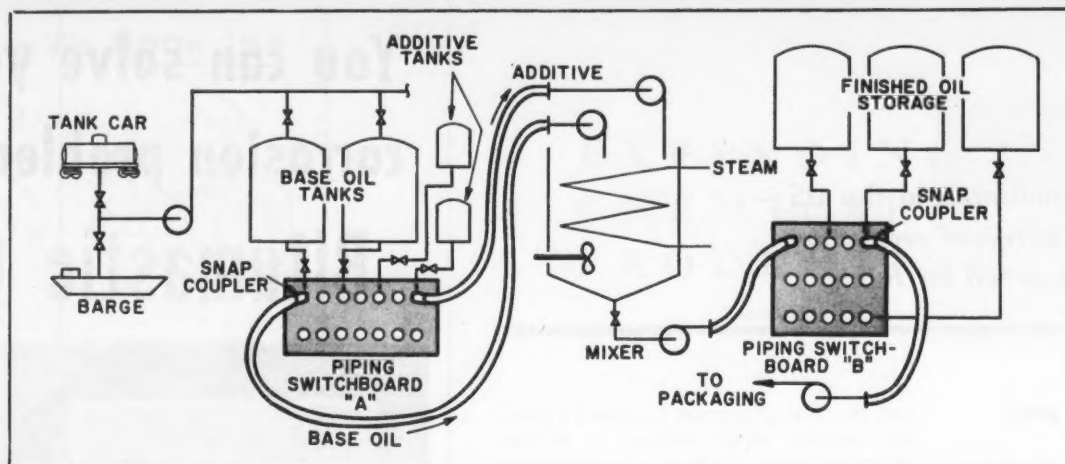
MADE ONLY BY KOPPERS

**BITUMASTIC** PROTECTIVE COATINGS

SOLD THROUGH INDUSTRIAL DISTRIBUTORS

**KOPPERS**

When inquiring check CP 5628 opposite last page



Use of leak-proof heavy-duty coupling allows quick switching of hoses . . .

## *pipingswitchboard speeds blending operations*

**Couplings have been in use five years without leaking or causing hose breakage**

Blending automobile oils and greases to specification and packaging them is a highly mechanized and largely automatic operation at the Gordon Lubricating Company of McKees Rock, Pa.

Base oil, the principal ingredient, is received by tank car or river barge and stored in storage tanks.

Mixing tank receives the basic fluid from base oil storage tanks through "piping switchboard A". Blending ingredients or additives stored in tanks are also connected to feed into the mixing tank through "piping switchboard A". After heating and stirring in a mixing tank the blended product is pumped to an appropriate tank for storage until it is to be packaged. Mixing tank discharge is connected to the right storage tank through "piping switchboard B".

Base oils and additives are received by river barge or tank car and piped to storage tanks. Base oil and blending material are piped from their respective storage tanks through piping switchboard A to mixing tank. Prepared mixture (finished oil) is pumped to storage tank through piping switchboard B. When market demands it, blended product is withdrawn from storage tank and fed through piping switchboard B to automatic packaging machine.

When a packaging run is to be made — say for quart-size cans of light lubricating oil of Brand X — the storage tank containing this compound is connected through switchboard B to a pump which feeds the compound to the packaging machine. Here the cans are automatically filled, sealed, and assembled into shipping cartons.

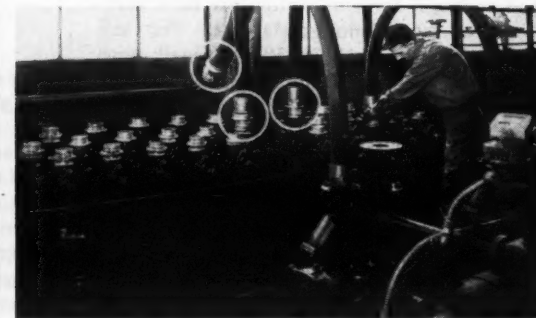
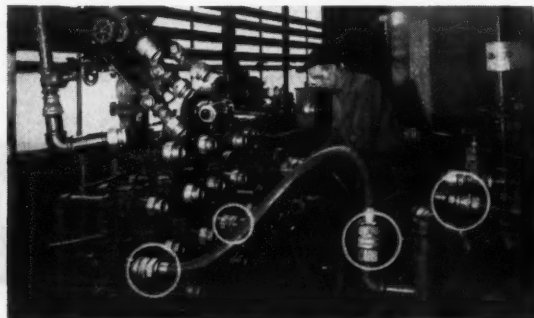
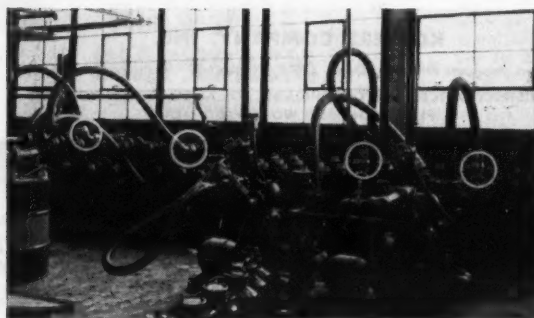
Each piping "switchboard" is an assembly of pipe-ends for the lines leading to the different storage tanks. They function as follows:

- 1) To switch any desired blending ingredient into mixing tank, operator connects that in-

Each pipe end on switchboard A at left is the end of delivery line from storage tank holding a particular base oil or additive. Flexible hoses (vertical loops) connect desired base oil or additive into inlet side of pumps which forces base oil or additive into mixing tank. To switch from one base oil or additive to another, quick-seal 3-inch coupling (in circle) at end of flexible hose is snapped onto another pipe end on switchboard.

Another section of piping switchboard B which permits rapid switching of finished oil from mixing tank to desired storage tank, or from desired storage tank to packaging machine. Each pipe end connects to one finished oil storage tank.

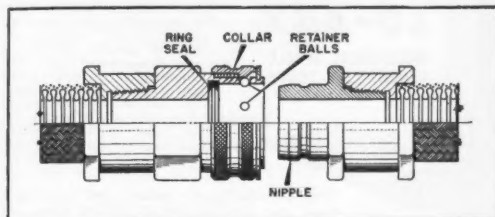
Close-up of piping switchboard B showing flexible hose (center) connecting one finished oil storage tank to pump that feeds packaging machine. To connect flexible hose to a tank operator pulls back collar on coupling body, slips body over nipple, and releases spring loaded collar, thus locking coupling body and nipple together.



## material handling

gradient's tank discharge line, through flexible hose, to pump feeding into mixing tank.

- 2) To "switch" mixing tank output into desired storage tank when blending is completed operator connects mixing tank discharge line, by flexible hose, to appropriate storage tank's inlet line on the switchboard.
- 3) Similarly, when the contents of desired tank are to be packaged, operator "hooks up" that tank to the packaging machine through the piping switchboard. That is, he connects the hose from desired tank's connecting line on the piping switchboard to the packaging machine feed pump.

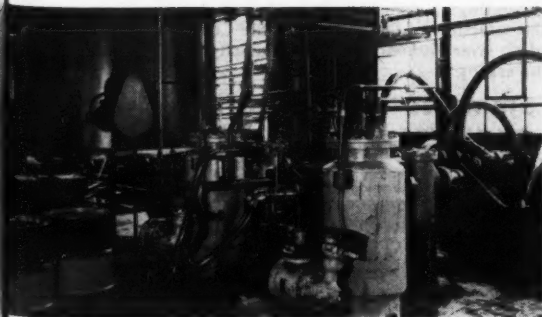


Cross-section of quick-seal hose coupling

This system affords great production flexibility. By pumping mixing tank's output to storage tanks, blending operations can be conducted whenever over-all plant operating conditions make it most desirable. Also, by keeping prepared blends in storage tanks, packaging runs on each product can be made as required by market conditions. Packaging and blending operations can each be run separately, whenever it is of the greatest advantage to do either. Storage of the prepared blends in tanks eliminates warehousing charges necessary if blended products had to be packaged as soon as they were prepared, and packages had to be warehoused until called for by market demand.

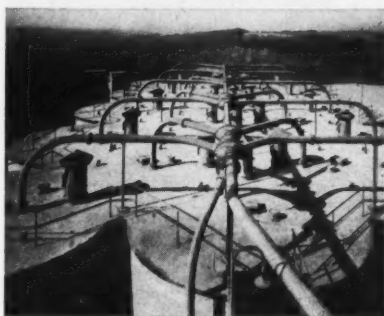
(Continued on page 77)

Mixing tank (left background) in which lubricants are compounded. Pumps discharge blended product from mixing tank, or feed base oil and additives into mixing tank, through flexible hoses (upper right) which connect pumps to piping switchboard A, partly visible at extreme right

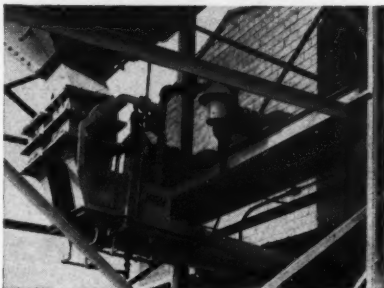


## Conveying dry bulk materials?

**FULLER** gives you specialized engineering from its many years of experience



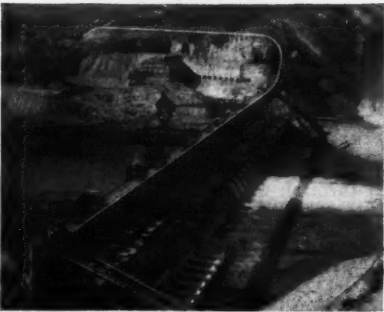
Fuller-Kinyon System



F-H Airslide



Airveyor System



Fuller-Fluxo System



The experience of over a quarter of a century in research, designing, and building various types of air-conveying systems, has given Fuller engineers a vast amount of "know-how", knowledge which is passed along to the purchaser in better and more efficient equipment.

When you have a problem of conveying dry, pulverized and granular materials, Fuller is the name to remember. Builders of four basic types of systems, it can readily adapt a system to fit into your plant, for the material to be handled. Thousands of Fuller systems are at work, day after day, in industry the world over, helping to cut costs to the minimum.

Write for Bulletin G-1, which will give you quite a comprehensive insight into the facts of air-conveying. It may be that you have never given any thought to this method of handling bulk, raw materials . . . it may well mean a first step forward toward consistently profitable operation and a smoother flow in production. Write us today.

**FULLER COMPANY, Catasauqua, Penna.**

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# Fuller

DRY MATERIAL CONVEYING SYSTEMS  
AND COOLERS-COMPRESSORS  
AND VACUUM PUMPS-FEEDERS  
AND ASSOCIATED EQUIPMENT

G-98  
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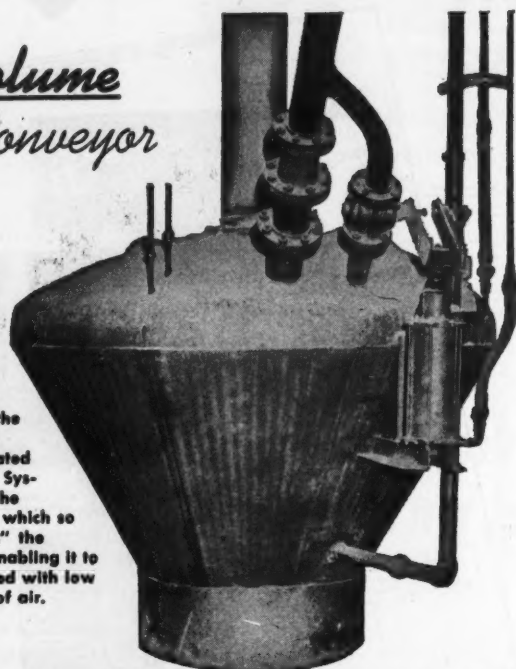
# Robinson

*Air Activated*

## Conveyor

The  
**Low-volume**  
Air Conveyor

Heart of the Robinson Air-Activated Conveyor System ... the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.



Averages 1 Cubic Foot of Air per Pound of Materials Handled

**R**ight here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

**ROBINSON**

*Air Activated*

A Division of  
Morse Boulger Destructor Co.

**CONVEYOR SYSTEMS**

211-V EAST 42nd ST. • NEW YORK 17, N. Y.  
Representatives in Principal Cities

When inquiring check CP 5630 opposite last page

## MATERIAL HANDLING

**Gives answer to problem of storage facilities**

Booklet tells how to set up facilities, make surveys, elevation drawings, and floor plans for most efficient storage. Booklet is intended for smaller layouts where services of layout specialists are not required.

For larger installations, company furnishes free layout services of storage engineers. Company is a supplier of steel shelving, parts bins, steel benches, trucks, etc.

Booklet "How to Solve Your Storage Problem" is issued by Equipto Div. of Aurora Equipment Co., Dept. CP, 100 Prairie Ave., Aurora, Ill. When inquiring specify CP 5631 on handy form opposite last page.

**Electric crane trucks handle 3-ton loads in tight spots . . .**

electromagnet may be attached to boom crane

Uses: For handling long, hard-to-manage loads in confined areas. Truck handles loads up to three tons.

Features: Crane is designed with slewing action to simplify handling on either side of travel area without additional movement. Boom on crane measures 12'6" in retracted position and extends to 19'2".

Description: Travel speed without load is 4 mph; with full 6000-lb load, 3½ mph. Hoist speeds: up without load, 28 fpm; with full load, 14 fpm; down without load, 15 fpm; with full load, 26 fpm. Slewing action operates through separate motor which drives grooved drum through worm and planetary gear reduction. Electric limit switch stops travel at extreme limits of slew travel.

Telescoping boom of built-up heavy channel is reinforced box-type constructed with ample bracing.

**ONE QUICK STROKE!**

Your load's ready to ROLL . . .

with these two new Weld-Bilt time savers

Amazingly easy to handle, lighter, smooth-rolling, new low-priced "Pal-Boy" is a great time-saver on single or double pallet loads up to 2500 lbs! ONE swift handle-stroke lifts your load to rolling position. New ball bearing booster rollers on each fork simplifies positioning under pallets. Has many new safety and load-saving features.

**NEW "PAL-BOY"**  
SINGLE STROKE MECHANICAL LIFT PALLET TRUCK



**NEW "LO-BOY"**  
MECHANICAL SINGLE STROKE LIFT TRUCK

Built unusually low, designed for versatility, this easy-moving "LO-BOY" handles single-faced pallets as well as standard skids and loads, with "One-Stroke" lifting speed. Light weight, compact, strong, with Automatic Free Handle Release, Handle Safety Spring, Foot Pedal "Jar-Free" hydraulic lowering, and other features. For loads up to 2000 lbs.

WIRE or write for new bulletin and low prices on these new Weld-Bilt SINGLE STROKE time-savers.

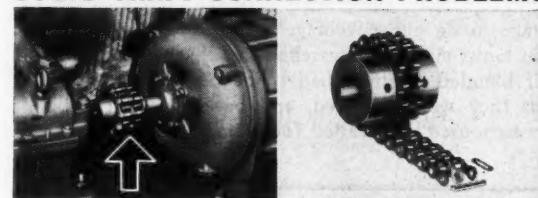
**WEST BEND EQUIPMENT CORPORATION**

*Materials Handling Engineers*

322 Water Street, West Bend, Wisconsin.

When inquiring check CP 5632 opposite last page

## DIAMOND FLEXIBLE COUPLINGS SOLVE SHAFT CONNECTION PROBLEMS



### ABSORB END-PLAY AND MISALIGNMENT

Consisting of hardened steel sprockets and two-strand Diamond Roller Chain, moderate angular and parallel misalignment and shaft end-float are absorbed in the clearances between the chain and sprocket teeth. The load is carried at the greatest possible radius and spread over the entire chain length.

Ease and speed of installation, long life and minimum maintenance are outstanding advantages of Diamond Flexible Couplings . . . Bulletin No. 19 includes complete data for the selection of Diamond Flexible Couplings from fractional to over 600 horsepower capacity. A copy is yours for the asking.

**DIAMOND CHAIN COMPANY, Inc.**

Dept. 411, 402 Kentucky Avenue, Indianapolis 7, Indiana  
Offices and Distributors in All Principal Cities

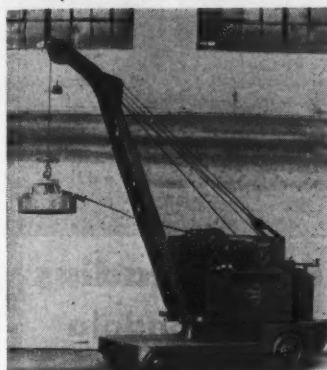
Please refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

**DIAMOND FLEXIBLE COUPLINGS**

When inquiring check CP 5633 opposite last page

CHEMICAL PROCESSING

## MATERIAL HANDLING



Crane has slewing action to simplify handling on either side of travel area without additional movement

ing. Magnet, one of several attachments which may be used on crane, receives its power from battery or from gas or diesel-electric generating unit.

(Crane Truck is a product of Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland 3, Ohio . . . or for more information check CP 5634 on handy form opposite last page.)

### Gives specifications, data on belt conveyor parts

Complete set of belt conveyor components pre-engineered for customer assembly is shown and described in four-page, two-color bulletin. Conveyor components are available from stock and can be purchased as package unit for complete belt conveyor installation or as repair or replacement units on existing conveyors of manufacturer.

Bul 1454 is issued by Standard Products Div., Stephens-Adamson Mfg. Co., Dept. CP, 11 Ridgeway Ave., Aurora, Ill. Specify CP 5635 on handy form opposite last page.

For more information on product at right, specify CP 5636 . . . see information request blank opposite last page.



## can you match this Ability with any one machine?

**Ability to dig** The Allis-Chalmers HD-5G Tractor Shovel is not merely a loader. It is a powerful excavator. It can dig into clay, break up and load hard-packed bulk chemicals. Bucket teeth and rear-mounted hydraulic ripper attachments are available to speed tough excavating jobs.

**Ability to load fast** With its big 1 1/4-cu-yd bucket — and the power to crowd it full — the HD-5G keeps loading and stockpiling jobs moving at peak production. Two-yard light materials bucket is available for snow, coal, and other light materials.

**Ability to maneuver** — in close quarters. It takes a crawler tractor to utilize such power and capacity in such a small space. The HD-5G pivots around within its own track length. Special high-speed reverse adds further to output on short-cycle jobs.

**Ability to handle any load** A wide variety of front-end attachments may be quickly interchanged with the standard bucket. Included are Lift Fork for packaged and palletized loads, Bulldozer for stripping and stockpiling, Crane Hooks for machinery and other heavy, solid objects, special Rock Buckets and Rock Forks. Drawbar is always available for heavy hauling jobs.

**Ability to work anywhere any time** The HD-5G has stability to work safely over rutted or uneven ground . . . traction and flotation to travel through snow, mud, sand where rubber-tired equipment cannot operate. It is the ideal machine both for materials handling and yard maintenance jobs.

Write for literature or ask your Allis-Chalmers dealer to tell you more about the versatility and flexibility of the HD-5G. Let him show you how its ability to switch from job to job — and to do each one well — can save you time, labor and specialized equipment.

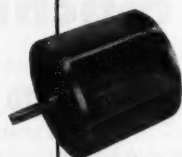
**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

PRESENTING!



## THE MOST ADVANCED ROTARY AIRLOCK FEEDER

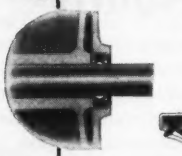
For stopping air leakage—when removing powdered or granulated materials from dust collectors, air classifiers, spray or rotary dryers and pneumatic conveying systems... it can be done more efficiently and economically with a PRATER ROTARY AIRLOCK—the answer to industry's need for a heavy duty unit. Available in 8, 10 and 12 inch sizes, it's ideal for handling practically any highly abrasive or soft granulated or attritionized material. Inquire today!



**CLOSED POCKET ROTOR**  
An unusual design—with integral side-plates and blades, no side wear, better sealing and longer life.



**OVERSIZED BEARINGS!**  
Standard in all PRATER FEEDERS. Self-contained, self aligning, lubricated and sealed for life.



**LEAK-PROOF DUST SEALS!**  
Unusual shaft seals prevent flushing of material and retains pressures—positive or negative.

Sooner or later...  
You'll make it

# PRATER



**WHAT'S YOUR PROBLEM?** Jot down the details of your application and mail them to us. Our engineers will help you plan your flow sheet and specify the proper equipment.

**PRATER PULVERIZER COMPANY**

1517 S. 55th Court • Chicago 50, Illinois

**Foremost Builders of Airlocks**

When inquiring check CP 5637 opposite last page

## MATERIAL HANDLING

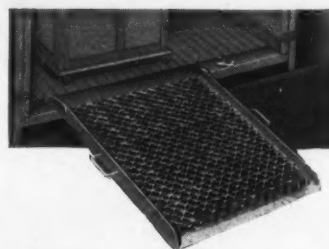
**Provides safe footing  
on loading docks**

**Uses:** For use in small incline from loading dock to truck body.

**Features:** Ramp has built-in safety pins to assure a non-slip grip.

**Description:** Open work surface of ramp prevents grease, oil and other slippery substances from being a safety hazard.

Grating permits even small casters to roll over its surface easily. Long platform is made in



Ramp's openwork construction provides sure footing

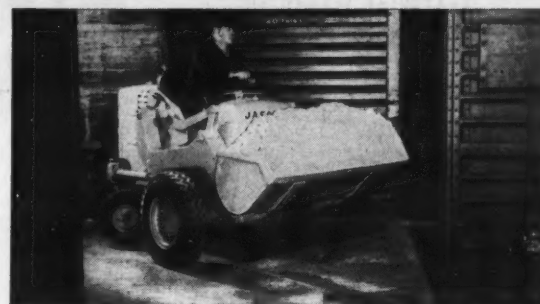
two standard sizes, 30" long x 27" wide and 30" long x 30" wide. Other sizes are built to order.

(Loading Ramps are a product of the Bustin Firm Grip Grating Corp., Dept. CP, Dover, N.J. . . or for more information check CP 5638 on handy form opposite last page.)

**Shows complete line  
of hydraulic cranes**

Illustrated eight-page bulletin describes indoor-outdoor hydraulic cranes. Included with specifications and performance data are diagrams on working range, manual boom extensions, minimum aisle width for turns, and attachments and special equipment.

Bul AD-2253 is issued by Austin-Western Co., Dept. CP, 601 Farnsworth Ave., Aurora, Ill. When inquiring specify CP 5639 on handy form opposite last page.



## Turns in 6½ ft. radius in box car or gondola

Rear steering wheels of the Auto-Scoop make shortest turn (5" shorter than other scoop loaders with bucket in carry position). Auto-Scoop also travels up to 25% faster (to 13.88 mph in reverse, 7.66 forward) — shortens time on every trip. Single lever provides split-second forward-reverse shift. Many other advantages that bring production gains, cut costs. Write for Catalog L12-4.

**JAEGER LOAD-PLUS  
auto-scoop**  
12 cu. ft.

1 cu. yd. Load-Plus available for bigger work.

**THE JAEGER MACHINE COMPANY**  
616 Dublin Avenue—Columbus 16, Ohio

When inquiring check CP 5640 opposite last page



20% more lifting capacity  
(1200 lbs.).



Higher clearance (6'8"),  
more reach (2'7").

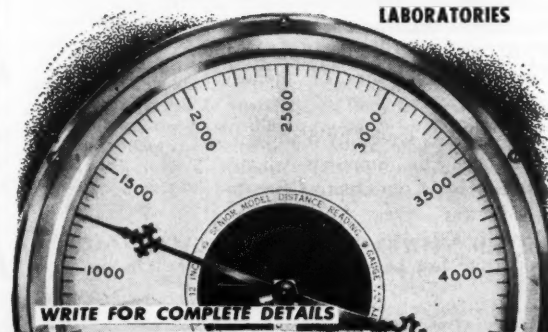
**"LIQUIDS WORTH STORING  
ARE WORTH MEASURING"**

with a

## LIQUIDOMETER

*Tank Gauge*

- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES

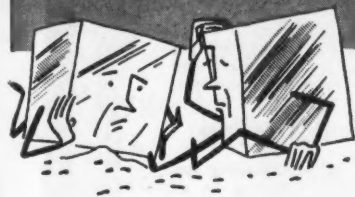


**THE LIQUIDOMETER CORP.**  
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 5641 opposite last page

CHEMICAL PROCESSING

The case of  
the grounded  
ice cubes...



The operations of a Buffalo ice-making plant came to a costly impasse. Ice cubes were grounded for want of some way to unclog their transporting devices. Hammering was slow and often damaging to the equipment.

There was a solution, however, that solved the problem economically and swiftly... a CLEVELAND vibrator.



Let us know about your grounded material, or ask for our detailed literature. Engineering recommendations without cost or obligation.

AIR *and* ELECTRIC



2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 5642 opposite last page

MARCH, 1955

## "SWITCHBOARDS"

(Continued from page 73)

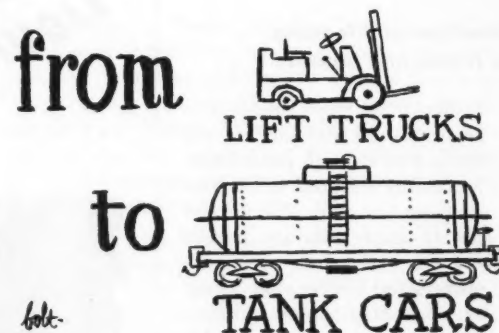
Connecting of mixing tank output line or packing machine intake line to right storage tank is where manual operation comes in. This switching of flexible hoses to tank lines on switchboard was a time-consuming operation until the Gordon Company adopted snap-type couplings for joining the flexible hose to tank line ends on piping switchboards.

To connect the special coupling requires only retracting coupling collar, inserting nipple into coupling, then releasing collar. This takes only a few seconds. Conventional threaded couplings usually required from five to ten minutes to connect or disconnect, and often entailed additional time loss while operator went after wrench to tighten or loosen threaded coupling.

Also, the coupling has full swiveling action. There is no quarter-turn or half-turn of hose required to connect or disconnect line. This full-swiveling action, avoids kinking or twisting of line — the action which rapidly causes hose breakage. Coupling also has sealing arrangement which keeps line leak-proof regardless of how high pressure in the line builds up.

Couplings have been in use over five years, often connecting and disconnecting them to pipe switchboard as many as 200 times a day. During that time they have remained easy to connect or disconnect, have not leaked, or caused breakage.

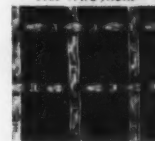
(Couplings are product of Titeflex, Inc., Industrial Sales Div., Dept. CP, Ten Hendee Street, Springfield 4, Mass. Check CP 5643 opposite last page.)



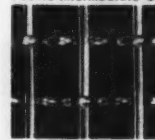
... your material handling problems may be solved through ideas, equipment, services described in this issue. The convenient Product Directory, located on pages 201 to 204, will guide you to all articles and advertisements.



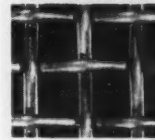
Flat Wire Mesh



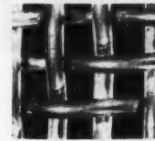
Double Intermediate Crimp



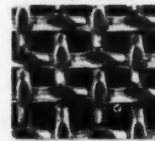
Single Intermediate Crimp



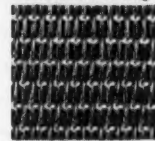
Double Crimped



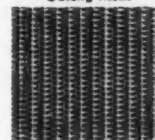
Twilled Weave



Calendered Backing



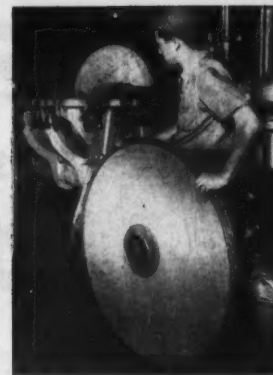
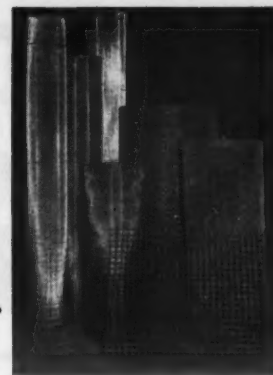
Oblong Mesh



Plain Dutch Filter



Twilled Dutch Filter



NO MATTER HOW YOU BUY

## INDUSTRIAL WIRE CLOTH

in bulk from stock | or special fabrications

YOU CAN RELY ON

*Cambridge*

**COMPLETE LINE**—Cambridge stocks include a wide variety of specifications from the finest to the coarsest mesh in any metal or alloy.

**QUALITY**—Accurate mesh count and uniform mesh size are assured by individual loom operation and careful inspection just before shipment.

**PROMPT SERVICE**—You get immediate delivery on the most frequently used types of cloth. If your needs are not in stock, we'll schedule our looms to get your material to you without delay.

**CAMBRIDGE ENGINEERS**, both in the home office and in the field, are fully qualified to help you select the cloth to meet your needs, whether you order in bulk or special fabrications. In fabricating parts of any type... filter leaves, strainers, sizing screens... we'll work from your prints or draw up prints for your OK.

**LET US QUOTE** on your next order for wire cloth. Call your Cambridge Field Engineer—he's listed under "Wire Cloth" in your classified telephone book.

**OR, WRITE DIRECT** for FREE 80-page CATALOG and stock list giving full range of wire cloth available. Describes fabrication facilities and gives useful metallurgical data.



## The Cambridge Wire Cloth Co.



Department F,  
Cambridge 3,  
Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 5644 opposite last page

# AUTOMATION

starts with

## PneuBin



### Pulsating Panels assure constant material flow from bins and hoppers

Automation is an empty word if your production is interrupted by material hang-up in bins and hoppers. That all-important initial step of material introduction must move smoothly, flawlessly or the whole concept of automation is destroyed. PneuBin will solve your flow stoppage problems and reduce your operating expense. The PneuBin unit consists of steel-backed, neoprene, pulsating panels mounted on the inside walls of your present bins, and air controls to regulate the panels' action. By the pneumatic inflation of the PneuBin panels, the bin contents are positively displaced to insure free flow. Automatic inflation and deflation continues in cycles at whatever frequency is set on adjustable control. PneuBin operates off the regular plant air supply.

PneuBin decreases plant operating costs by reducing maintenance and adding to the life of your bins; insures constant material flow; and greatly increases personnel efficiency through its quiet operation.

Send for "Flow Stoppage Report" and FREE literature. PneuBin engineers will gladly make recommendations with no obligation on your part.

SOME FRANCHISED SALES TERRITORIES STILL AVAILABLE

## PneuBin

A PRODUCT OF  
**GEROTOR MAY CORPORATION**

1527 Maryland Ave., Baltimore 3, Maryland

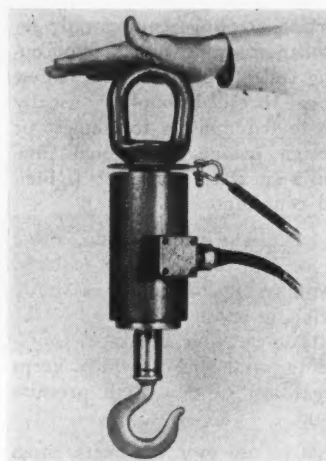
When inquiring check CP 5645 opposite last page

## MATERIAL HANDLING

### Develop crane scales of small capacities

Crane scales in capacities of 1/2, 1 1/4 and 2 1/2 tons have been added to line of scales using SR-4 load cells.

Direct-reading load indicating instrument may be mounted in crane cabs, on carts, or in stationary posi-



Scale crane 18" high for 1000 lb

tions. Cable reels provide freedom of movement of crane scales.

(SR-4 Crane Scales are product of Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Philadelphia 12, Pa. Check CP 5646 opposite last page.)

### Describes unit loading of trucks and boxcars

Folder of six pages describes in detail how to load boxcars and trucks with unitized pallet loads. Specifically designed to describe shipping zinc oxide, this method can be used with any bagged material. Sketches, photo-sequences and layouts make it easy to understand proper loading techniques. Method applies for ordinary fork lift truck and for those equipped with Pul-Pac attachment.

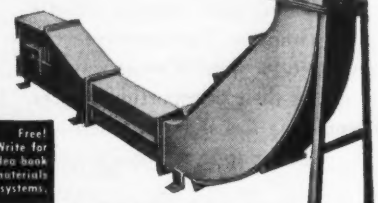
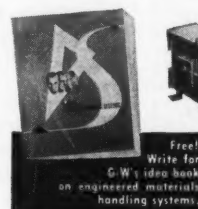
Unit Load Folder is available from St. Joseph Lead Co., Dept. CP, 250 Park Ave., New York 17, N.Y. Specify CP 5647 opposite last page.

for bulk  
**MATERIALS  
HANDLING**

One unit feeds, conveys, elevates through horizontal, vertical or inclined planes... quickly, efficiently, economically. It's the...

### G-W FLOWMASTER

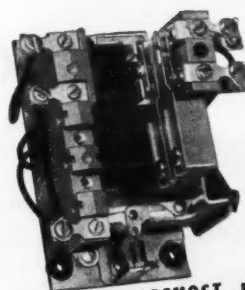
...a self-loading, self-discharging system of steel flights... moving on an endless all-steel chain... through a dust-tight casing. Unusually versatile. Write today.



## GIFFORD-WOOD Co.

HUDSON, N. Y. AND PRINCIPAL CITIES

When inquiring check CP 5648 opposite last page



FIRST and FOREMOST  
IN THE FLOATLESS  
CONTROL FIELD

Control variations in levels from 1/4" upward. Remote control if desired — any distance. Controls unaffected by acids, caustics, pressures or temperatures.

Since 1933 B/W Controls have provided positive, dependable, economical liquid level control. No floats! No moving parts in liquid.

WRITE FOR CATALOG  
**B/W CONTROLLER  
CORPORATION**

2204 E. Maple Road  
Birmingham, Mich.

When inquiring check CP 5649 opposite last page

CHEMICAL PROCESSING

Check the  
Liquid Level  
From Anywhere  
in the  
Room

with the  
**NEW  
CONVEX  
SCALE**  
Jerguson  
TRUSCALE  
Remote Reading  
Gage



Available with  
Explosion Proof  
Illumination.

Compensated Manometric Gage meets  
new interpretation  
of the boiler code  
for WSP of 900 psi  
or higher.

You get full 180° visibility . . . so you can read the liquid level from any point from which you can see the gage . . . with the New Convex Scale now available on Jerguson Truscale Remote Reading Gages. Scale markings are directly on the convex face and the indicator goes clear around the convex surface. You can stand at one end of the control room and instantly check your whole line up of Truscale Gages.

Jerguson Truscales give you instant remote readings of liquid levels of waste heat boilers, tanks, etc. . . with the amazing accuracy of 1/2 of 1% of scale reading. And with the New Convex Scale you make these readings from any angle . . . accurately, without distortion. Truscales also available with lights, horns and Truscale Repeaters.

Write today for complete data on  
Truscale Gages with the New Convex Scale.

**JERGUSON**

Gages and Valves for the  
Observation of Liquids and Levels  
**JERGUSON GAGE & VALVE COMPANY**  
100 Fellsway, Somerville 45, Mass.  
Offices in Major Cities  
Bailey Meters & Controls, Ltd., London, Eng.  
Contrôle Bailey, Paris, France

When inquiring check CP 5650  
opposite last page

MARCH, 1955

## MATERIAL HANDLING

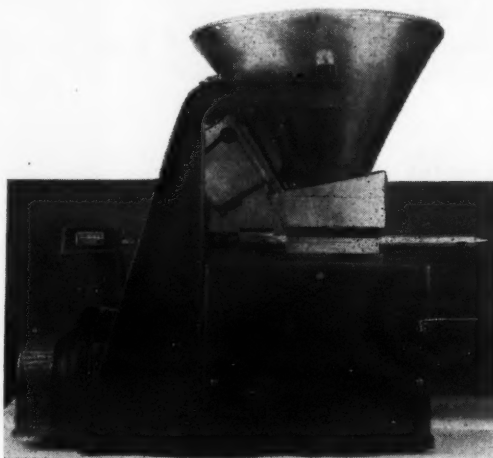
**Gives minute-to-minute uniformity  
when feeding dry materials  
in oz or tons/hr . . .**

feeds any powdered material from hopper to  
process with accuracy of 1%

**Uses:** For continuous addition of powdered  
material to any process, blending, or water treat-  
ing operation, where constancy and accuracy of  
feed rate must be maintained.

**Features:** Feeder can be built in any size from  
ounces to tons per hour with a feed range of 30  
to 1. Two simple change parts, furnished as extra  
equipment, extend this range to 200 to 1.

It feeds almost any powdered material with an  
accuracy of  $\pm 1\%$  by actual weight, minute-to-minute  
in a steady stream. It functions with equal pre-  
cision with granular, crystalline, sticky materials.



Feeder functions with accuracy of 1%

**Description:** Feeder employs density control  
along with volumetric metering, and uses vibra-  
tory flow to insure complete filling and emptying  
of measuring element. There is no erratic air en-  
trapment to disrupt volume measure. Also, fluc-  
tuations due to compacting of material within  
hopper or storage take place before and during  
filling of measuring chamber.

Measuring element is a screw that provides a con-  
tinuous volumetric measure. In each cycle it is  
completely filled with material of standardized  
density, irrespective of material density in supply  
hopper. It is completely emptied to provide an  
unvarying volumetric measure for each cycle. Driven by a fractional-hp synchronous motor, through an infinitely variable planetary transmission, speed and feed adjustments are made by a micrometer motion, dial-calibrated to 400 divisions.

(Vibra Screw feeder is a product of Vibra Screw,  
Dept. CP, P.O. Box 25, Glen Ridge, N.J. . . .  
or check CP 5651 opposite last page.)



The **MOST COMPACT**  
and **MANEUVERABLE**  
5,000 pound Fork Lift Truck ever made!

Here, in the new Model 500, are the performance features you requested . . . NEW compactness and maneuverability previously found only in much smaller units. NEW power to spare for handling up to 2 1/2-ton loads. NEW day-long efficiency under the most severe working conditions from both gasoline and Diesel models.

Here are versatile power, capacity and performance long needed in a compact, maneuverable fork lift truck. Find out how the new Towmotor Model 500 fork lift truck can meet your handling requirements . . . and turn more of your present handling costs into profit. For complete information, call or write your local Towmotor Representative, or TOWMOTOR CORPORATION, Div. 2303, 1226 E. 152nd St., Cleveland 10, Ohio.

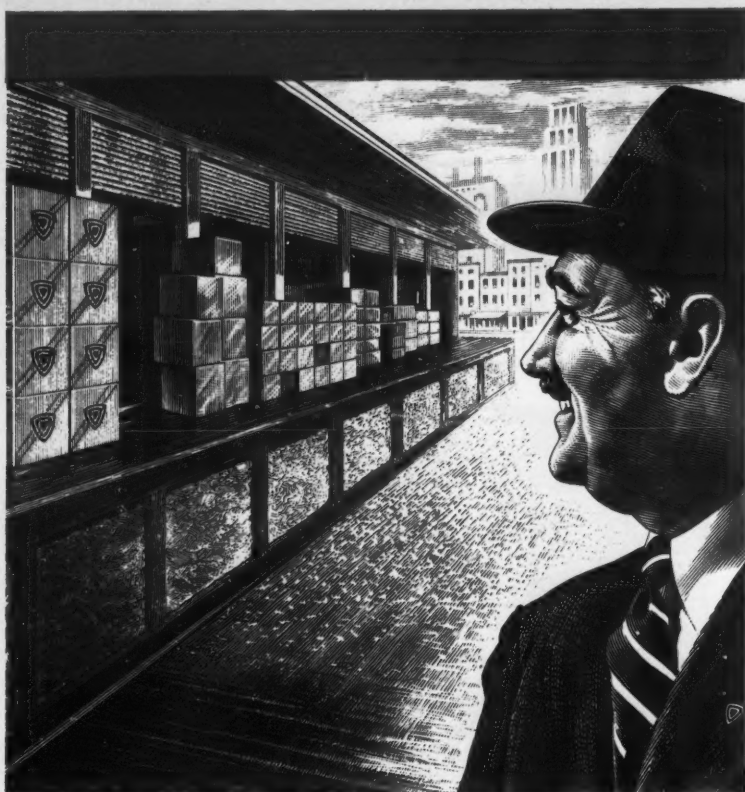
**TOWMOTOR**  
THE ONE MAN GANG

**FORK LIFT  
TRUCKS  
and TRACTORS**

- ★ NEW Power and Compactness
- ★ NEW High In Maneuverability
- ★ NEW Handling Speed And Efficiency
- ★ NEW Driver Comfort
- ★ PLUS All Other TOWMOTOR Advantages

Manufactured Only By Towmotor Corporation—The Pioneer Maker Of Fork Lift Trucks

When inquiring check CP 5652 opposite last page



## HAVE YOU LOOKED LATELY?



CORRUGATED AND SOLID FIBRE BOXES  
FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES  
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

*How long since you've seen your product on a loading dock, side by side with your competitors? Does your container reflect the care and quality you've put into your product?*

*Gaylord Boxes are built to quality standards as exacting as those you insist upon in your own plant. You and everyone with whom you do business will recognize the look of leadership Gaylord containers add to your products.*

*Does your product deserve a Gaylord container? For fast service, contact your nearby Gaylord sales office today.*

## material handling

Perfected "biting" approach  
allows tractor shovel to . . .

## move bulk material— 18 cu ft in one gulp

### Breakout action of bucket and 40° tip-back speed material handling operations

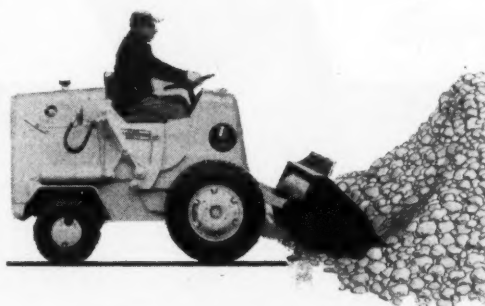
**Uses:** For interior and exterior bulk materials handling operations which require lifting, digging and carrying capacities combined in single unit.

**Features:** Bucket arm design permits

exceptional breakout action of bucket and 40 degrees of tip-back. This makes it possible to carry heaped loads at a low level, providing stability and good operator vision.

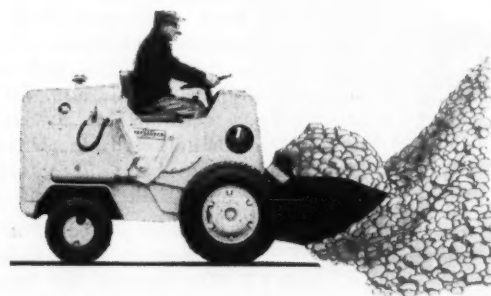
**Description:** Easily maneuvered out and into boxcars, tractor-shovel unit goes a long way in solving problem of handling bulk materials.

Payload capacity is 18 cu ft and struck-load



Three thousand pound push  
gets bucket well into load

Tip-back of 40° provides good  
breakout action with 18 cu  
ft load



Load rides low to provide  
good stability and give op-  
erator unobstructed view

capacity is 14 cu ft. Maximum discharge height is 5' 2½". Turning radius is 6'3½", and wheel base is 44". Unit is powered by gasoline or diesel.

Torque converter drive and full reversing transmission are combined to provide fast operating cycle and ease of operation.

Increased operator safety standard is achieved by combination of bucket arm design which keeps the arms below operator's level and hydraulic accumulator which minimizes load shocks and stabilizes hydraulic controls.



Small but powerful tractor-shovel gets into cramped quarters and combines digging, lifting and carrying operations in single unit

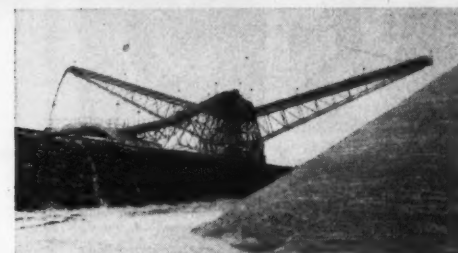
Sealed and pressurized hydraulic system has been incorporated and double-acting rams operate boom-arms and bucket.

(HA Payloader is a product of the Frank G. Hough Co., Dept. CP, Libertyville, Ill. . . . or for more information concerning manufacturer's product, reader may simply check CP 5653 on the convenient Reader Service slip which is located opposite last page.)

Nomograph on page 186 shows viscosity of sulfuric acid in a jiffy



## Stockpiles Phosphate Rock 7 Stories High—and Keeps Handling Costs at Rock Bottom



Stacker discharges 1088 foot center trunk line belt conveyor to either side. Rock is piled at a rate of 635 long tons per hour.

This giant traveling stacker has a "wingspread" of 220 feet and stands taller than a 7 story building. Engineered by S-A for the Virginia-Carolina Chemical Company's plant at Nichols, Florida, it stockpiles huge quantities of phosphate rock for drying prior to final moisture removal in a huge kiln. Rock moves from storage to the kiln via a tunnel belt conveyor system.

The phosphate rock is fed to the stacker wing conveyors by a 36-inch trunk line belt conveyor running on 1088 foot centers along the storage area. Rock flows to either of the two wing conveyors extending from the stacker tower at a rate of 635 long tons per hour. Rail clamps permit stationary operation of the stacker which forms piles about 90 feet high.

S-A "Simplex" carriers with spun end rollers turning on roller bearings protected by labyrinth seals are used on both trunk and boom belts. Other design features include S-A Hold-Backs which prevent belt reversal in case of power failure and Spring Type Belt Wipers which insure a clean belt surface in contact with the return rollers.

While a stacker piling rock 90 feet high may be beyond your needs, the same S-A engineering and manufacturing skill is available for your own specific problems—to help you handle your product at lowest cost per ton, using whatever type of bulk material handling equipment is best for you. Write, without obligation, for a free survey.



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Specialists in the design and manufacture of all types of bulk materials conveying systems.

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When inquiring check CP 5654 opposite last page



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- ... articles must be terse, to-the-point, vital, pertinent to the job-interests of readers, adequate in information.
- ... headlines must inform quickly what each article is about... no vague or "tricky," misleading heads to waste readers' time.

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**CHEMICAL PROCESSING**  
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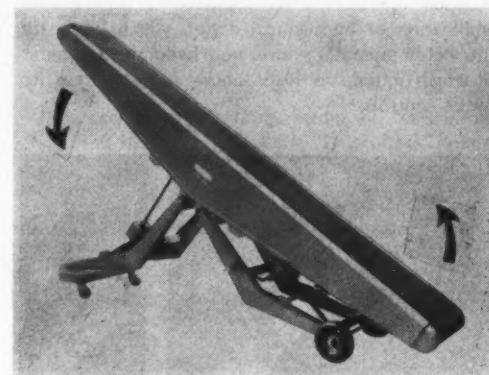
"Executive Magazines  
For Industry"

### MATERIAL HANDLING

#### Elevates at either end to load or unload...

conveyor has capacity of 500 lb in horizontal position, 350 lb at an angle

Uses: For loading and unloading trucks, railway cars, etc., and for various off-level handling



Portable conveyor raises and lowers independently

problems such as bridging from platform to platform or car to car.

**Features:** Very light in weight and completely mobile conveyor has positive belt tracking, start-stop-reverse switches, and controls at both ends.

**Description:** Power belt conveyor raises and lowers independently at either end. It adjusts from either right or left side to a 30° incline, with each supporting leg adjustable independently.

From a maximum horizontal position 61" high, both legs can be adjusted to bring conveyor surface to as low as 22" off ground.

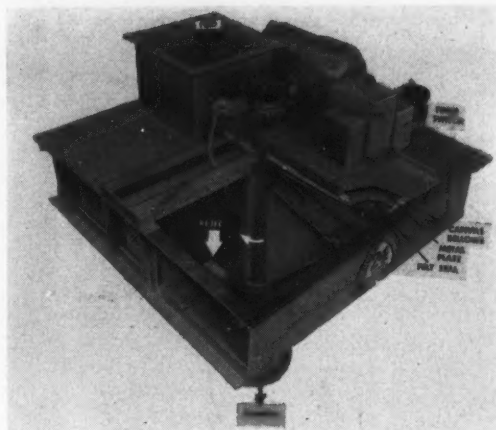
It has a capacity of 500 lb in horizontal position and 350 lb at an angle.

(SpeedLift conveyor is a product of Speedways Conveyors Inc., Dept. CP, 134 Speedways Bldg., 202-08 Rhode Island St., Buffalo, N.Y. . . . or check CP 5655 on handy form opposite last page.)

#### Intermittent automatic sampling provided by dust-tight unit

Uses: For applications where fine, dusty material must be sampled and where it is not necessary to take a large portion of entire feed.

**Features:** Solenoid-controlled cover over cutter opening prevents continuous sampling. Felt pad rests firmly on cutter blades — effectively sealing them against entrance of dust. This pad is attached to metal plate (see illustration) which is attached, in turn, to a canvas bellows. Bellows is secured to bottom surface of cover plate.



Permits dust-tight intermittent sampling of dusty dry materials

**Description:** Solenoid is connected by an arm to bottom metal plate. When timing mechanism operates, it starts motor and actuates solenoid, lifting sealing unit. This causes felt pad to be withdrawn free of cutter blades and allows cutter to rotate under sample feed chute. When sample is cut, cutter turns back to its original position. At this point, limit switch cuts off current to solenoid and motor, allowing cutter cover to return by gravity, again sealing cutter opening.

Entire unit is sealed with gaskets to prevent passage of dust to the outside. No part of electrical circuit, motor, or mechanism is exposed to dust. Timing circuit is normally designed to operate on 115 or 230 volt, single phase alternating current. Motor and solenoid usually operate on three-phase current.

Timer switch has synchronous motor and is adjustable for any interval between 2 and 55 minutes — in one minute increments.

(Vezin sampler is a product of Denver Equipment Co., Dept. CP, 1400 17th St., Denver 17, Colorado . . . or for more information check CP 5656 on handy form opposite last page.)

#### How to unload boxcars while sitting down

Ten pictures are used in four-page, two-color bulletin to show how bulk can be unloaded from boxcars. Operation of automatic power scoop is shown in all phases. Bulletin explains that operations can be safer and cheaper than conventional methods since operator, seated on equipment, is not exposed to dust and accidents.

Bul 1654 is issued by Stephens-Adamson Mfg. Co., Dept. CP, Aurora, Ill. When inquiring specify CP 5657 opposite last page.

## A completely new and different **PAYLOADER®** TRACTOR SHOVEL



#### BUCKET CAPACITY

18 cu. ft.  
PAYLOAD

14 cu. ft.  
Struck-Load

### NEW standards of safety, capacity and low maintenance

The greatest advance in tractor-shovel design in years — with more features — more digging power — more capacity — more performance than you ever thought possible in a tractor-shovel of this size.

The famous HA "PAYLOADER" has led the industry for over 15 years — this NEW 1955 Model HA is even more sensational. It has twice the digging power, lifting capacity and carrying capacity — has 16½% more bucket capacity — 18% more dumping height — and will increase output from 50 to 100%.

Before you buy any tractor-shovel, see this new Model HA — ask your dealer for a demonstration — find out what it can do to reduce your bulk material handling costs.

# NEW MODEL HA

#### Outstanding features:

Powerful "break-out" digging action Upward rotation of the bucket combines with forward motion of machine in a powerful slicing action that gets full loads quickly, even from lumpy, sticky or heavy materials.

Bucket tip-back of 40 degrees when only 6 inches off the ground carries heaped loads low and close for maximum stability, balance and safety.

New standards of safety Boom arms and parts are mounted low and carry loads low and are always clear of the operator. Operator visibility is good at all times.

Advance-design hydraulic system includes: sealed, pressurized hydraulic tank — no breathing of dirt and grit into hydraulic fluid; hydraulic accumulator prevents pressure shocks — gives easier, safer control.

Torque-converter drive and full-reversing transmission with two speed ranges insures fast moves in either direction — easier operation and control — more production.

Improved steering. Ball-bearing screw-and-nut type steering with tapered roller bearing bell crank and oversize ball joints — easy-acting, readily-adjusted, low in maintenance.

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- ☐ Send me complete model HA information
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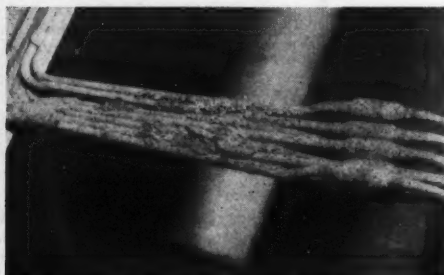


When inquiring check CP 5658 opposite last page

## **Dekoron<sup>®</sup>** PLASTIC ARMORED METAL **cuts instrument tubing costs** *2 ways...*

**FIRST**—Dekoron tubing costs less than expensive alloy instrument tubing.

**SECOND**—Dekoron outlasts every other type tubing which Samuel Moore & Company has studied... has outlasted every kind of tubing which customers have reported trying.



Dekoron tubing still in good condition after 2½ years' exposure to deposits high in hydrochloric acid. Copper was destroyed in 18 months.

Dekoron tubing is not metal only, not plastic only—it combines the advantages of both materials. Dekoron has a thick, corrosion-resistant coating of polyethylene or vinyl plastic tightly extruded over copper or aluminum. Or for special installations, steel can be used.

Lengths of Dekoron tubing are joined with standard fittings covered with plastic tape to make the complete installation impervious to corrosive fumes from acids and alkalis, moisture, salt air, oils and grease. No expensive painting or other maintenance is required.

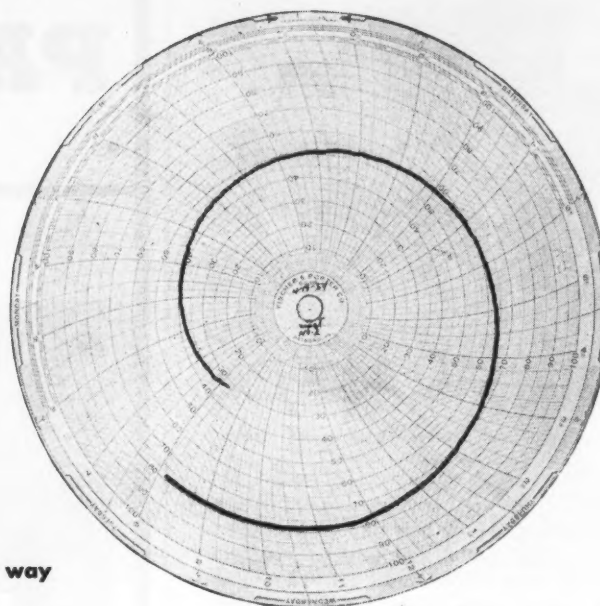
If you have a corrosion problem, write for Bulletin L-6506 "3 Ways to Whip Corrosion and High Tubing Installation Costs in Your Plant."

AA-981

**Dekoron tubing**

**SAMUEL MOORE & COMPANY**  
Dekoron Products Division  
MANTUA, OHIO

## INSTRUMENTATION



"Dead reckoning" was the only way paper plant could tell how much liquid chlorine was on hand... now they

Record shows tank level (and use) for one week

## *bring tank level signal through hermetic seals*

**Problem:** A feast or famine situation developed in liquid chlorine supply at the Mechanicville, N.Y. plant of West Virginia Pulp and Paper. Chlorine was supplied mostly by a generator in the plant; balance was purchased. Plant-produced chlorine was stored in condenser receiver tank until it was full, then blown into either of two storage tanks at 140 psi.

Pressure gages were watched to tell when tanks were full. By dead reckoning of consumption versus fillings, engineers arrived at an approximate figure for amount on hand. To further complicate things, supplementary chlorine was weighed-in from tank cars.

Specific drawbacks were 1) danger of overfilling storage tanks and building up dangerous pressures if ambient temperature got too high, 2) uncertainty about just how much chlorine was on hand at any time, and 3) occasions when supply tank ran dry — allowing pressurizing air to get into pulp. This invariably caused so much foaming that plant had to shut down to clean equipment.

**Solution:** Crisis arrived when a new three-stage

bleaching system was installed for processing hardwood pulp. Increased demand and purchases of chlorine made older system unworkable. Instead, remote-indicating level instruments were installed.

Cable and drum indicators on each of the tanks have a magnet follower in place of conventional float. Follower travels in a stainless tube sealed at both ends so that chlorine cannot escape to contact mechanism. Outside this tube a float containing magnets rises and falls with liquid level. Magnetic coupling allows follower to transmit liquid level to indicator through cable.

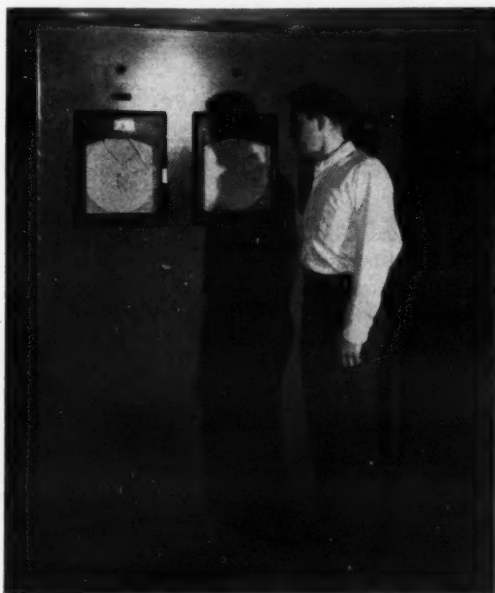
Level of each tank is then transmitted electrically (using an impedance bridge) to recorders. Low level alarm, built into recorders flashes a warning light whenever liquid level in tanks drops to eight inches. Thus there is an indicator at the tanks themselves and also a record and warning at a remote location in the plant.

**Results:** Now that tank levels can be read accurately at any time, there is no danger of overfilling tanks. Track scales for purchased chlorine



Indicator at tank shows feet and inches of liquid. This reading is transmitted to . . .

. . . remote recorders with low-level alarm



are no longer needed, either. Direct reading supplants calculation from track scales in filling tanks. Record of chlorine use is helpful in accounting, too.

(Levelator indicator and instrument system for this installation was engineered by Fischer & Porter Co., Dept. CP, 48 Jacksonville Rd., Hatboro, Pa. . . . or for more information check CP 5660 on handy form opposite last page.)



## No maintenance problems with this instrument!

In spite of all of the development work being done on automatic control instruments, the Bristol Series 500 Air-Operated Controller is still the most dependable and trouble-free — as proved by thousands of installations. And here's why:

**It's the simplest to service.** Only one adjustment with a  $\frac{1}{4}$  in. wrench calibrates the control system. No other adjustment is needed. Control system can be completely disassembled and, after reassembly (even with replacement parts), can be *exactly calibrated by this one simple adjustment.*

**It's completely reliable.** One user states, "I'm amazed at the way this instrument performs day-in and day-out with little or no attention. We call it the work-horse controller in our plant. And our plant men like to use it, because it gives them the precision results they need without having to fuss with it".

**Its settings are exactly reproducible.** Reset rate, deriv-

ative time, and proportional band adjustments are accurately calibrated and exactly reproducible. You can instantly reproduce established settings without cut and try.

**It uses the world-famous Bristol measuring elements.** The measuring systems used in Bristol Series 500 Air-Operated Controllers for TEMPERATURE, PRESSURE, FLOW, VACUUM, DRAFT, ABSOLUTE PRESSURE, LIQUID LEVEL, pH, AND HUMIDITY are the result of 65 years of experience in instrument making and application in practically every industry. Bristol measuring elements are recognized the world over for their accuracy, simplicity, and reliability. There just aren't any better measuring elements made than Bristol's.

For more facts and figures about the Series 500 Air-Operated Controllers, write for free 32-page bulletin A120. The Bristol Company, 141 Bristol Road, Waterbury, Connecticut.

4.27

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# BRISTOL

POINTS THE WAY IN

HUMAN-ENGINEERED INSTRUMENTATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 5661 opposite last page

For more  
*Dependable*  
transmission of  
pressure data  
NEWLY DEVELOPED TELEDYNE HAS  
15 RANGES FROM 0 TO 10,000 P.S.I.



## Teledyne

BONDED STRAIN GAGE  
ELECTRICAL  
PRESSURE TRANSMITTER

Now, men engaged in chemical research, testing and processing can measure, record and control gas and fluid pressures with a highly accurate and DURABLE electrical pressure transmitter. These features make Teledyne the most advanced piece of equipment of its kind available:

- 15 ranges (0 - 10,000 PSI) for wide application
- Bonded strain gage construction (insensitive to vibration or shock)
- Stainless steel pressure chamber for handling corrosives
- High frequency response
- Linear output over full pressure range
- Easily disassembled for clean out and repairs
- Insensitive to accelerations in 2 horizontal planes and vertically less than .3% of full scale per "G"
- Temperature compensated for zero shift and sensitivity change.

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When inquiring check CP 5662  
opposite last page

## INSTRUMENTATION

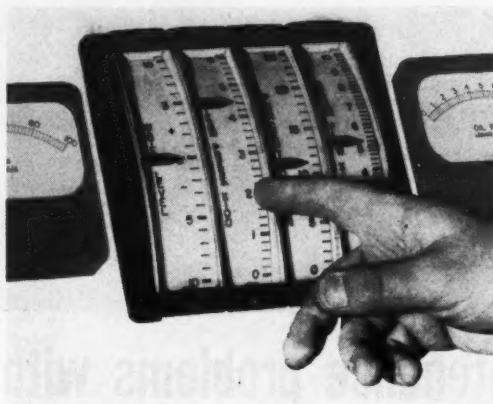
**Electric or pneumatic signals  
actuate miniature  
indicators . . .**

units have 5-inch usable scale and may be  
flush or semi-flush panel mounted

**Uses:** Designed for indicating pressure, draft,  
flow, level or temperature from electric or pneu-  
matic sensing element.

**Features:** Gages can be provided with two units  
in single case and two pointers on single scale.  
Zero adjustment is simplified. Units may be easily  
removed from control panels.

**Description:** Pneumatic gage uses spring-loaded  
metallic bellows with built-in overpressure pro-  
tection as its actuating element. Electric model



uses specially designed motor, electronic amplifier,  
and pair of differential transformers in null bal-  
ance circuit. Indicators have 5-inch usable scale.

(Miniature indicators are products of The Hays  
Corp., Dept. CP, 742 E. 8th St., Michigan City,  
Ind. . . or for more information concerning  
manufacturer's product reader may simply check CP  
5663 on convenient Reader Service slip opposite  
last page.)

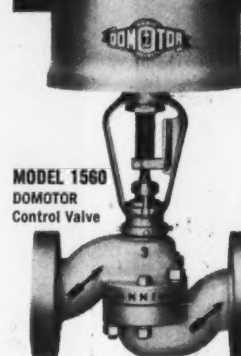
**Plug-in type meter movements  
easily replaced in cases  
of controllers . . .**

instrument line is available with five different  
chassis and control forms

**Uses:** Controls temperature in batch and con-  
tinuous processing. Control modes range from two-  
position (on-off) to electric proportional which  
maintains continuous linear relationship between  
value of controlled variable and input rate.

**Features:** Plug-in measuring system and plug-in  
control chassis may be inspected, repaired, or sub-

## DOMOTOR DOES MORE IN THE ACCURATE, AUTOMATIC CONTROL OF HARD-TO-HANDLE FLUIDS



MODEL 1560  
DOMOTOR  
Control Valve

Other models by Annin—  
Solenoid-operated, Model 1520  
Handwheel Valve, Figure 15

**Is your problem the precise  
control of erosive and  
corrosive fluids at high  
or low temperatures?**

If so, investigate the ANNIN  
DOMOTOR control valve, wherein  
internally controlled differential  
pressures, acting across a sealed-  
in piston, provide the motive  
power for operation. The  
DOMOTOR combines powerful  
valve action with exceptional sta-  
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guaranteed positioning accuracy  
of 1/1000 of valve travel.

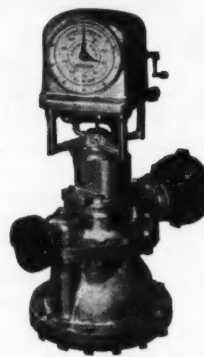
Standard models withstand pres-  
sures to 5,000 psi with special  
applications to 50,000 psi. Effec-  
tive temperatures from -325°F  
to 1200°F.

Write today for Catalog 15008

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6570 E. Telegraph Road  
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*Control*  
**VALVES**

When inquiring check CP 5664 opposite last page



**for all liquid-  
handling problems**

• In any processing operation where the main-  
tenance of a uniform temperature in the process  
pipes is necessary, a Hetherington & Berner  
jacketed system will assure dependable, eco-  
nomical production. This is equally true regard-  
less of whether the material being handled re-  
quires a hot or cold temperature, what heating  
or cooling medium is used, or whether the ma-  
terial is corrosive or non-corrosive. Write for

Bulletin J-50. If you have a liquid batching problem,  
involving either light or heavy liquids, jacketed or un-  
jacketed construction, investigate the *Fluidometer System*.  
This system gives accurate, dependable and *completely*  
*automatic* batching and is adaptable to practically any  
liquid measuring problem, whether it involves gallons,  
barrels or tank cars. Write for Bulletin FI-49.



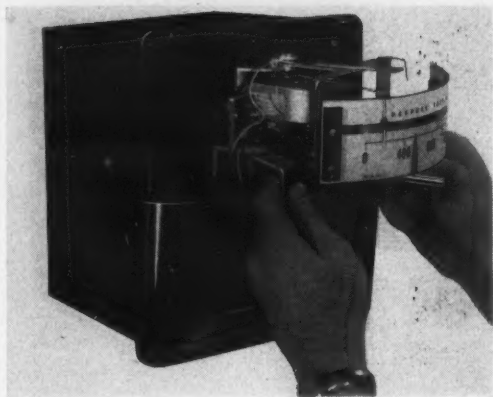
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711 KENTUCKY AVE. INDIANAPOLIS 7, IND.

When inquiring check CP 5665 opposite last page

## COMPLETE Jacketed Pipe and Fluidometer Systems



CHEMICAL PROCESSING



Plug-in meter movement or chassis can be easily removed for servicing or inspection

stituted with minimum of delay. Controller may be obtained as two-position, anticipatory time-proportioning, multi-position, heavy-duty (mercury plunger relay), or proportioning "stepless" control.

**Description:** Two-compartment die-cast aluminum case, designed for either flush or surface mounting houses components of "400" Series Capacitrol.



Temperature controller is available in variety of control forms

Upper section contains plug-in measuring system — lower section, plug-in control chassis. Controller employs oscillating-amplifying circuit which is highly stable with respect to line voltage fluctuations and ambient temperature changes. Unit includes balancing adjustment for tuning alignment index and indicating

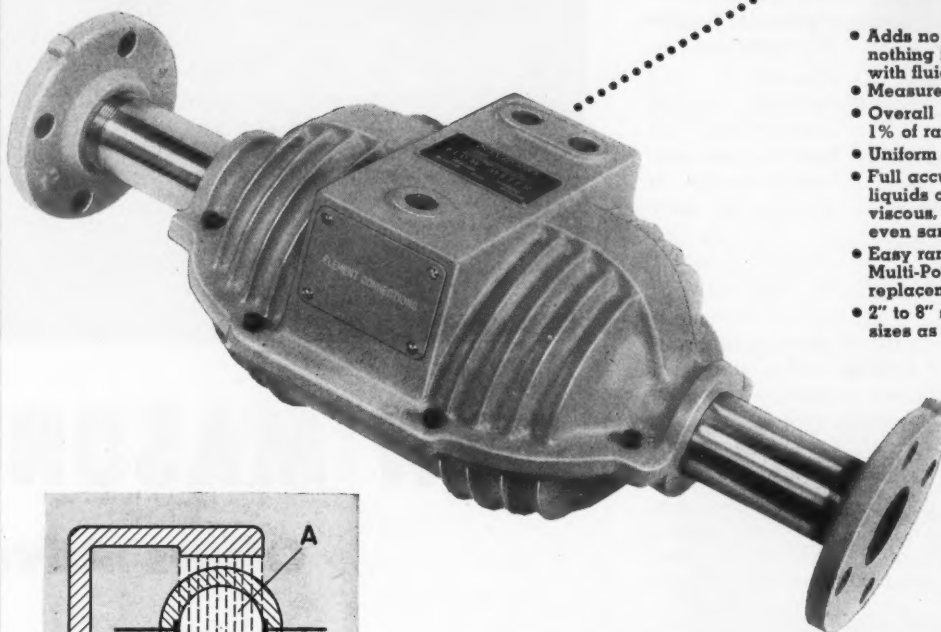
pointer to coincidence. Standard 12AU7 dual triode vacuum tube is obtainable from any electronic supply house. Calibrated accuracy of instrument is  $\pm 1/4$  of one per cent total span.

(Series 400 Capacitrols are products of Wheelco Instrument Div., Barber-Colman Co., Dept. CP, 1300 Rock St., Rockford, Ill. . . . or for more information check CP 5666 opposite last page.)

#### Need instrumentation for that process?

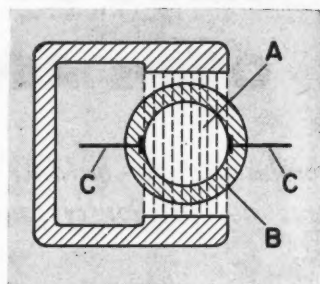
You'll find just what you need in the alphabetized, itemized Product Directory on pages 201 to 204. All subjects and products presented in ads and editorial columns are there.

## NEW! a flow meter with no flow restrictions!



- Adds no pressure drop — nothing inside pipe to interfere with fluid flow.
- Measures fluid velocity directly.
- Overall accuracy better than 1% of range over entire scale.
- Uniform flow scale.
- Full accuracy sustained even on liquids other meters can't handle: viscous, corrosive, or pulpy — even sand-water slurries.
- Easy range change — either by Multi-Point Switch or range coil replacement, as preferred.
- 2" to 8" sizes standard — larger sizes as required.

FOXBORO  
MAGNETIC  
FLOW METER



#### SIMPLE, TROUBLEFREE, OPERATION

The Foxboro Magnetic Flow Meter operates on the same principle as a power generator. A magnetic field (A) is maintained through a standard pipe section (B) of stainless steel or other non-magnetic material. This pipe section is lined with Kel-F® or other insulating material. Liquid passing through pipe acts as moving conductor, generating an electric voltage which varies in proportion to liquid's average velocity. Flush electrodes (C) in pipe wall "pick up" this voltage which is recorded in desired flow units by Dynalog Electronic Recorder or Controller.

This premium-performance meter measures *magnetically* the flow rate of virtually any liquid except hydrocarbons. It completely ignores such common metering headaches as turbulence, suspended solids, and variations in conductivity, density, and viscosity. It even measures reversing flows.

**Installation** is simple. The magnetic spool piece connects into the line like any equivalent length of pipe — no seals, purges, meter runs, or straightening vanes required. Connects by 2-conductor cable to remote Dynalog Electronic Flow Recorder.

**Maintenance** is practically eliminated. There are no pressure taps to become plugged or frozen, no working parts to foul.

Foxboro Magnetic Flow Meters are already in use on such widely different liquids as beer, sand-and-water, rosin size, rock-and-acid slurry, viscose, and highly corrosive liquid detergent. Find out how this precise, troublefree flow meter can help your processing. Write for complete details.

THE FOXBORO COMPANY, 813 NEPONSET AVENUE, FOXBORO, MASS., U. S. A.

**FOXBORO**  
REG. U. S. PAT. OFF.

Foremost in  
FLOW METERING

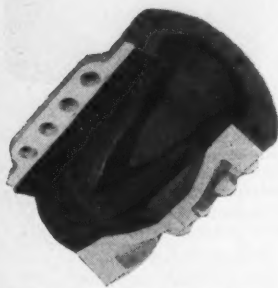
FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

When inquiring check CP 5667 opposite last page

## INSTRUMENTATION

**Flow is straight-through  
in valve for slurries,  
liquids, gases . . .**

air or hydraulic pressure acts to constrict throat or choke it off completely



Control valve for solids in suspension

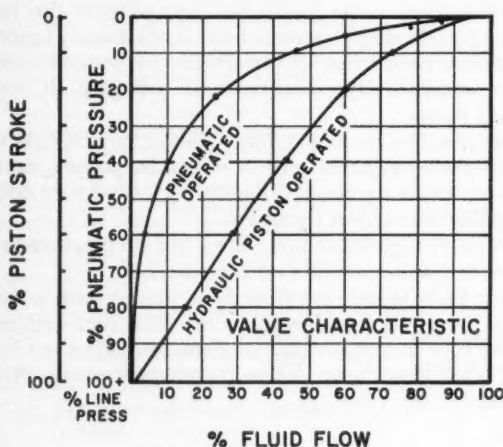
**Uses:** As a control valve for handling solids in suspension, acid slurries and other balky materials.

**Features:** Unit operates directly from instrument air line for low pressure service or through air booster relay for high pressure service. It

operates by solenoid valve for timer program service.

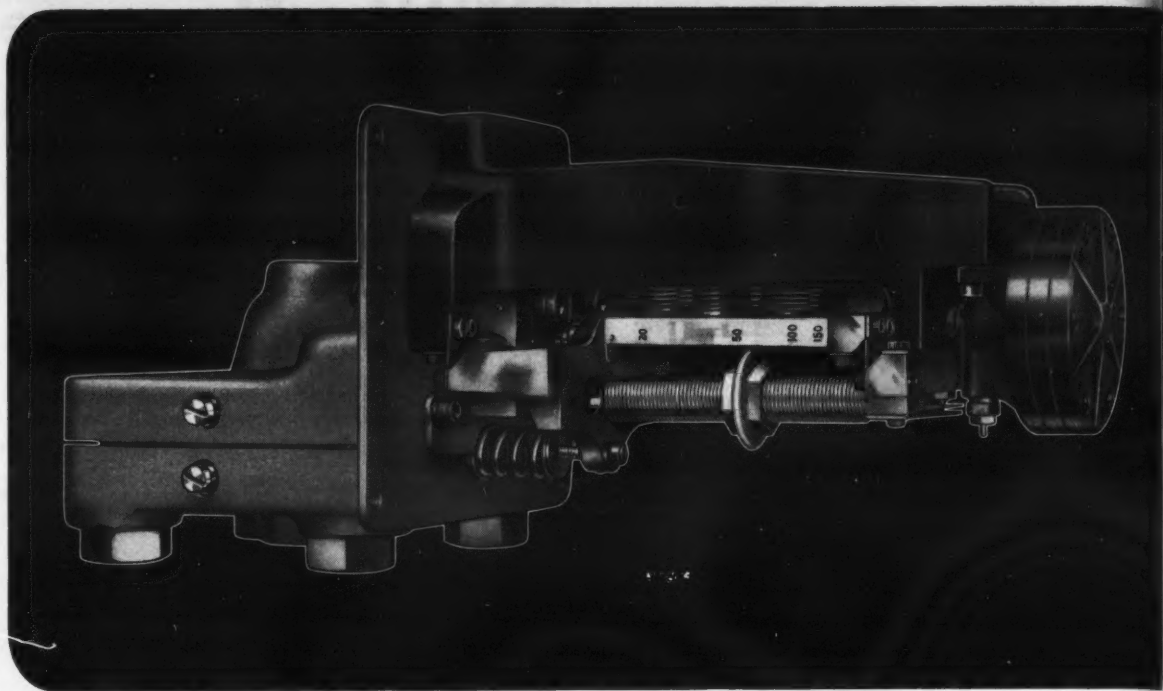
**Description:** Air is forced directly into valve body's annular space between rubber sleeve and body itself. Air compresses sleeve to a closed position. Sealing area of valve is 50% of length of rubber tube and permits tight shutoff even with solids encased in tube.

Sleeve is made of pure gum rubber with reinforced multi-ply cords and withstands abrasive wear because of resilient characteristic of rubber. It is also furnished in butyl, Neoprene and other special materials.



Valve body is cast iron and is available in sizes ranging from 1 to 24". It is suitable for pressures up to 150 psig. Steel valve bodies are available for pressures of 600 psig and higher.

Also available for use with unit are accessories including three-way valve, air gages, check valves, valve positioners, solenoid valves, booster relays,



# NEW MASONEILAN MODEL 48

## Offers Advantages Never Before

*This new, compact, force-balance type precision instrument offers advanced design features not previously found collectively in any similar transmitter. For example:*

- Has standard Masoneilan balanced, amplifying relay type pilot.

- Air passages all contained in sturdy mechanism frame — no tubing or fittings used inside cover.

- Damping unit is *sealed* — damping fluid cannot be lost in any position of the instrument.

- Heavy section mechanism frame bolted directly to diaphragm

housing, and cover mounted to a floating plate, eliminating distortion due to outside forces acting on case.

- Diaphragm housing is rugged AISI Type 316 stainless steel forging; avoids possibility of distortion from piping.

- Self-aligning, friction-free flexure bearings of beryllium copper for greater strength.

- Mounting is on diaphragm housing — point of greatest mass — insuring sturdy installation.

- Adjustments provided with locks to insure retention of calibration.

- Overrange protection provided for differential pressure equal to maximum static rating. Diaphragm protected against overload or negative differential.

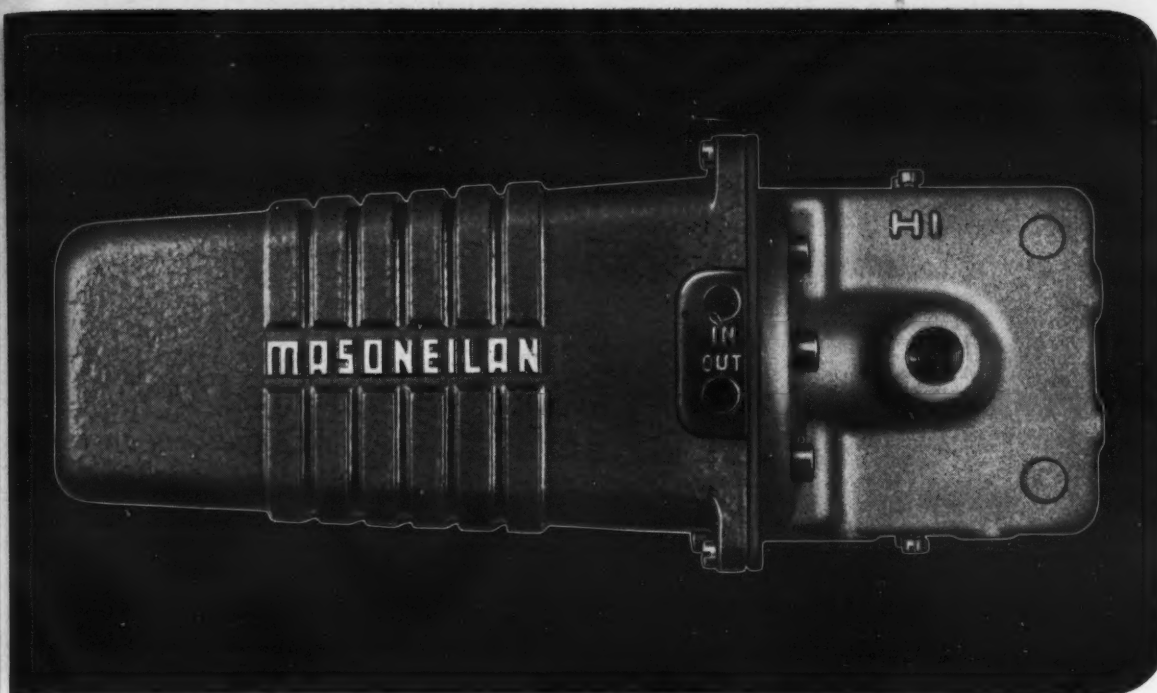
● Extra he  
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● Material

**MASONEILAN**  
120

Sales Offices or  
Philadelphia •  
Boise • I  
Corpus



# EL 4800 DP TRANSMITTER

## Combined in One Instrument

- Extra heavy primary beam minimizes bending.
- Drain connections at lowest point in diaphragm housing; vent connections at highest point in diaphragm housing — insures proper venting and complete drainage of condensate on both high and low sides.
- Materials selected for maxi-

imum strength and accuracy with highest corrosion resistance and minimum temperature error (1% per 100°F ambient temperature change).

These and other design features make Masonneilan Model 4800 Differential Pressure Transmitters outstanding among instruments of this type. Write for complete information.

MASONEILAN

### MASON-NEILAN REGULATOR CO.

1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas • Seattle • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

When inquiring check CP 5668 opposite last page

### SPECIFICATIONS

- Range — Adjustable from 20" to 200" H<sub>2</sub>O
- Static Pressure Rating — 1500 psi
- Ambient Temperature Rating — minus 30°F to plus 180°F
- Weight — approximately 30 lb.
- Pressure Connections — ½" NPT internal
- Air Supply — 20 psi
- Output — 3-15 psi

handwheel-operated hydraulic cylinders, pneumatic and hydraulic-operated cylinders.

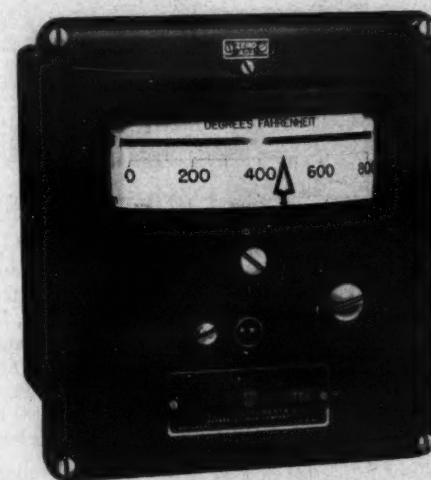
(Valve is a product of Red Jacket Co., Dept. CP, 510 Investment Bldg., Pittsburgh 22, Pa. . . or for more information check CP 5669 on handy form opposite last page.)

### Thermocouple or resistance bulb used as sensing element in controller

**Uses:** For indicating and controlling temperature in processes.

**Features:** Direct deflection resistance galvanometer in temperature measuring system works from thermocouple or resistance bulb output.

**Description:** Instruments are of two types: on-off controller and "straight line" controller that eliminates over or under-run of set point. Minimum lag occurs because no direct linkage is used between measuring and control system. Frequency



Controller handles temperatures to 3000°F

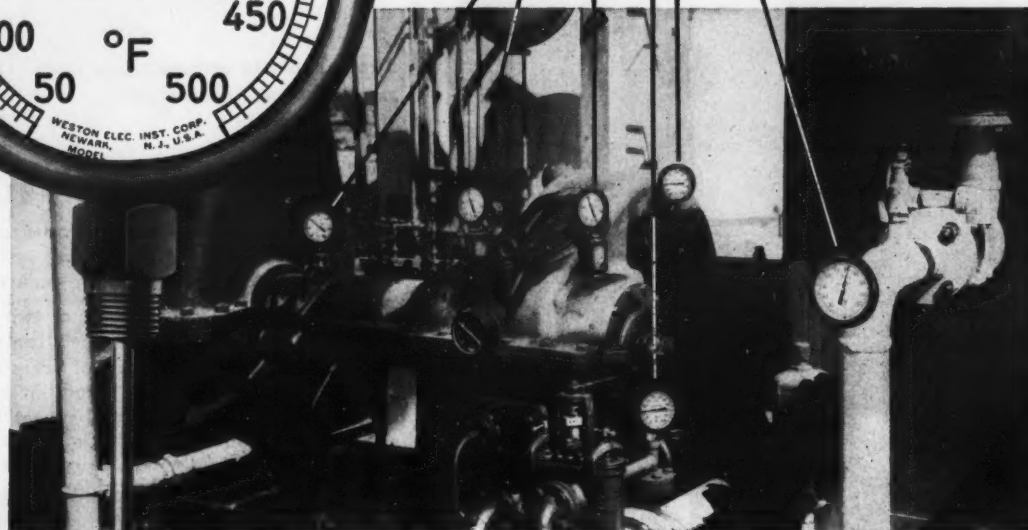
of oscillating current flowing between coils on temperature setting lever is changed when metal flag on temperature indicating pointer arm moves between coils. Change in frequency actuates solenoid to open or close relay contacts.

Contact ratings for SPDT switches are 10 amp at 115v and 5 amp at 230v non-inductive loads. Units are 7 5/8" wide by 7 25/32" deep by 8 1/8" high.

(Mod 292 Series Capacitrols are products of Wheelco Instruments Div., Barber-Colman Co., Dept. CP, 1300 Rock St., Rockford, Ill. . . or check CP 5670 on handy form opposite last page.)



**AT EVERY  
CHECKPOINT**



## **WESTON all-metal THERMOMETERS** (with Multiple Helix\*)

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.

\*This WESTON-made sensing element is the more costly, non-sagging, multiple-helix. Carefully aged over a broad temperature range for long periods, it assures better accuracy, over a longer life.

**WESTON**  
5537

*Thermometers*

Stocked  
by leading  
Distributors

When inquiring check CP 5671 opposite last page

## **INSTRUMENTATION**

### **Operations of 30 machines monitored simultaneously . . .**

provides instantaneous and permanent record of their operation, cycle, and downtime

**Uses:** For monitoring operations of up to 30 machines simultaneously.

**Features:** Recorder is not limited to machines of production nature. It can be used to record any motion or activity where a small switch can be attached.

**Description:** Electrosensitive paper is marked when current passes through styli. When there is



Recorder indicates what's happening at thirty different points at once. Inset shows operator making notations on the record with electric stylus

no electricity there is no mark. Current to activate styli is picked up by switches on equipment.

Switches are attached by bolt, thumb tack, tape or just slipped onto machine, drawer, door, window, or whatever is being monitored.

(Recorder is a product of Alden Electronic and Impulse Recording Equipment Co., Dept. CP, Westboro, Mass. . . . or for more information reader may simply check CP 5672 on handy form opposite last page.)

### **Uses gyroscopic principle to measure mass rate of fluid material . . .**

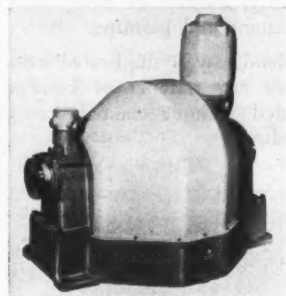
meter not affected by viscosity, temperature, pressure or compressibility of fluid

**Uses:** Provides precision weight measurement of flowing liquids of any density or viscosity within flow range of 10 to 500 lb/min. Meter is useful in process control, automatic batching, blending and proportioning, material balance studies, cost accounting, and bulk plants.

## INSTRUMENTATION

**Features:** Meter accuracy is fundamentally independent of temperature, pressure, viscosity or volumetric flow rate. Unit measures directly in pounds or tons per unit time.

**Description:** Fluid to be metered is sent through pipe coil revolving at right angles to coil axis. Fluid has angular momentum similar to that of a conventional gyroscope wheel. By spring-retaining the coil, a torque is produced at right angles to both coil and rotational axes. This torque is converted to AC voltage by high output electromagnetic signal generator. Voltage is directly proportional to mass rate flow.



Gives linear response from zero to maximum flow within  $\pm 0.25\%$

Flow rate indication accuracy is  $\pm 1\%$  by meter or  $\pm 0.5\%$  by potentiometer. Flow integration accuracy is  $\pm 0.25\%$ .

Other specifications include: resolution, better than 0.1% of full scale; hysteresis, less than 0.1%; pressure rating, 150 psi max; temp rating, 0 to 160°F.

Meter body is of Type 300 stainless steel. Flanges fit 1 1/4" pipe. Unit is approved for Class I, Group D service. Overall dimensions of meter are 34" flange to flange; 28" wide, and 37" high.

(Mod 4550 Gyro Mass Meter is a product of Controls Div., Control Engineering Corp., Dept. CP, 934 Washington St., Norwood, Mass. . . . or for information check CP 5673 opposite last page.)

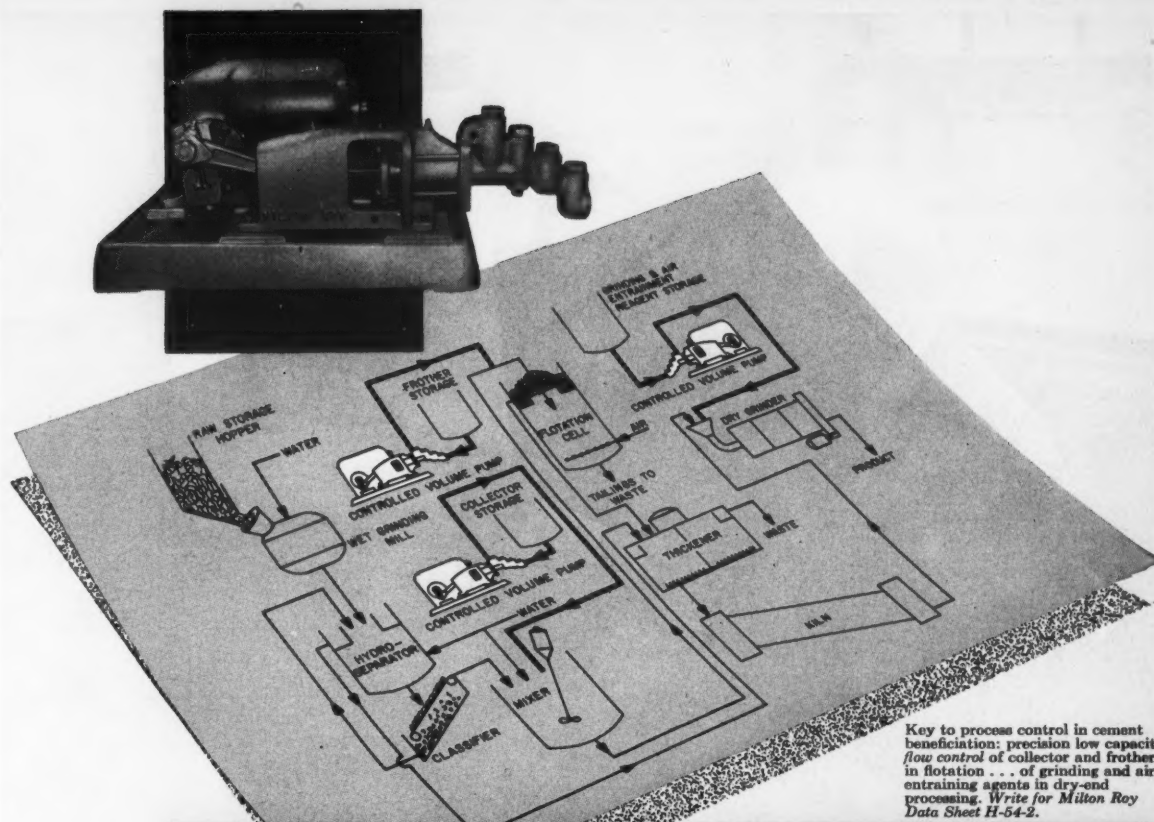
### Automatically controls water flow through wide range of pressures . . .

self-cleaning regulators are available in 1/2 and 3/4" pipe sizes for 2 to 8 gpm delivery

Low cost valve of brass construction uses flexible orifice which varies its size uniformly and inversely in proportion of pressure to control flow of water. Units maintain flow rate through pressure range of 15 to 125 psi.

Regulators are accurate within 5 to 8% over and under their mean capacities when used in proper pressure range. Units with 2 to 4 gpm capacity use 1/2" IPT female connections — those from 5 to 8 gpm take 3/4" IPT female connections.

(Flow regulators are products of Bell & Gossett Co., Dept. CP, Morton Grove, Ill. . . . or for information check CP 5674 opposite last page.)



Key to process control in cement beneficiation: precision low capacity flow control of collector and frother in flotation . . . of grinding and air entraining agents in dry-end processing. Write for Milton Roy Data Sheet H-64-2.

## new flow-control approach

solves low-capacity chemical flow problems...

reduces chemical costs, safeguards product quality

### Controlled volume pumps are flow control instruments

Have you found this solution to your low-capacity flow control problems?

Controlled Volume Pumps are designed to meter and pump additives, inhibitors, filter aids, dyes, defoamers and other low-capacity chemical flows to within 1 percent accuracy. Pumps are available in capacities up to 1350 gallons per hour . . . pressures up to 50,000 pounds per square inch . . . with manual or automatic speed and stroke adjustment.

Cement beneficiation (above), froth flotation for purification of low grade ores, continuous phosphatizing of metal surfaces, hydrostatic testing and plant water treating are a few examples of how these pumps are successfully applied in the metal and mining industries.

Bulletin 1253 "Controlled Volume Pumps in Process Instrumentation" describes typical applications industry-wide. Write for your copy, or send your problem to Milton Roy Company, Manufacturing Engineers, 1300 East Mermaid Lane, Philadelphia 18, Pa.

Engineering representatives in the United States, Canada, Mexico, Europe, Asia, South America, and Africa.



When inquiring check CP 5675 opposite last page



## How to Select an Economical Temperature Regulator

First of all, what does *economy* mean where temperature regulators are concerned? In some industries it means improvement of product or reduction of spoilage through closer control of process temperatures. In others, it means the paring down of operating expense. The price of the regulator itself is a relatively small factor.

Today's buyers are shopping for:

1. Accuracy of control — not only when the regulator is new, but throughout its service life
2. Dependability — to prevent loss of production time
3. Minimum installation and maintenance cost

Here are a few tips on what to look for when you're installing a new or replacing an old temperature regulator —

**Packless construction . . .** and for this reason: A diaphragm operated, packless regulator minimizes friction. There are no closely fitted parts to stick or bind

because of uneven expansion or collection of foreign matter. Also, there's less maintenance, since no repacking is ever required.

**A guarantee against wire drawing** of the seats and discs. Insist on it. This guarantee in combination with single seat design assures you of tight shutoff; you avoid expensive steam losses as well as loss of product in a process application.

**Broad control range.** In a standard regulator you should expect a control range of 100 F. And make sure the unit you select has a vapor tension thermostat that can take over-temperatures of at least 100 F.

**Easy maintenance.** Why ask for grief? Your temperature regulator should be basically simple in design so that it can be serviced by average plant personnel. All parts should be readily accessible for testing and cleaning.

**Double duty.** There's no point in buy-

ing a separate pressure regulator when you can select a temperature regulator that combines both temperature and pressure control within the same unit.

**Self-operating.** Make sure you get a regulator that operates on its own initial pressure. By doing so, you avoid the purchasing and maintenance of an air compressor plus air piping, and you're sure of uninterrupted operation during electric power failures.

All of these points are important to you when it comes to selecting an economical temperature regulator. Perhaps you didn't realize you could expect so much. And perhaps you didn't realize that Spence Temperature Regulators offer all these features and more. May we send you our Bulletin T 500 containing further details?

SPENCE ENGINEERING COMPANY, INC.  
Walden, New York

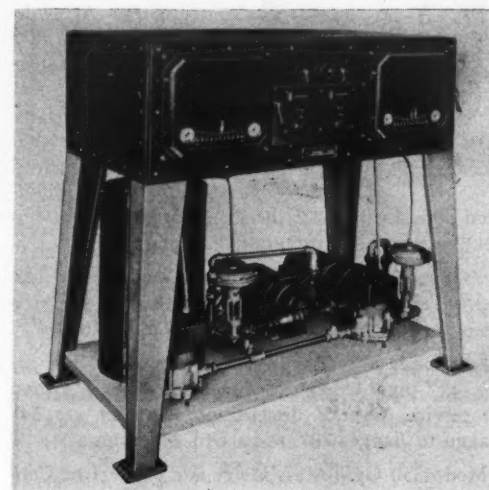
## INSTRUMENTATION

**Delivers uniform blend automatically to tank trucks, cars, and storage with high accuracy . . .**

packaged unit contains all necessary instruments, flow pickups, valves, strainers, filters

**Uses:** For blending operations such as caustic dilution, asphalt blending, cutting of heavy fuel oil, and blending of butane and gasoline.

**Features:** Desired blend may be duplicated with accurate uniformity for any number of batches and produced as needed without manual errors inherent in batch-blending.



Continuous automatic blender contains all necessary instruments and controls for liquid blending of two components

**Description:** Two-component blender was designed to provide a complete "package" unit for "on stream" blending. There are two types:

**Flow Responsive Blender** — Capable of automatically varying output to process demand. This covers requirements for truck loading and supplying several process loads simultaneously where it's impossible to preset blend rate to satisfy demand.

**Controlled Rate Blender** — Has rate control and will maintain preset rate independent of changes in composition to match a given process requirement. Rate can be accurately maintained in spite of fluctuations in supply and discharge pressure. Output can be manually regulated so that mixer or heat exchanger operates at peak efficiency.

Operation is fail-safe. Blender shuts down if proper proportions are not maintained. Dry run can be made to check blend setting, also.

(Blenders are a product of Proportioneers, Inc., Div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence 1, R.I. . . or for more information check CP 5677 opposite last page.)

When inquiring check CP 5676 opposite last page

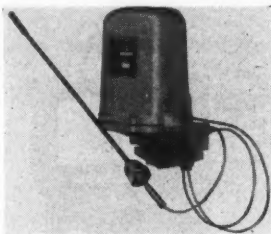
**Non-indicating force balance device  
pneumatically transmits temp  
to recorder or controller . . .**

transmitter designed around gas-filled thermal system which exerts force on flapper-nozzle

**Uses:** Measures process temperatures and pneumatically transmits signal to central recording or controlling station.

**Features:** Spans ranging from 50° to 400°F are available and can be used between limits of -100° and 1000°F. Instrument is completely weather-proof, permitting installation in hazardous or corrosive outdoor areas.

**Description:** Non-indicating instrument uses force balance system with calibrated accuracy of 1/2% of temperature span and is compensated for ambient temperature and barometric pressure variations. Transmitter is designed around gas-filled system which exerts force on flapper-nozzle mechanism in proportion to measured temperature. Resulting back pressure in nozzle circuit is amplified through relay and converted to force through bellows. This force balances out initial force and constitutes 3-15 psi output transmitted by tubing to receiving instrument.



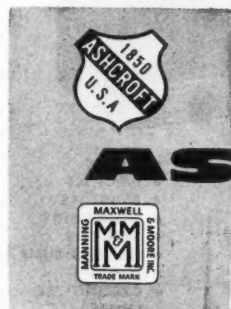
Polyvinyl-protected capillary tubing (3 1/2') connects temperature bulb to transmitter. Block and clamp mounting arrangement secures instrument to vertical or horizontal pipe or flat surface.

(Mod 12A transmitters are products of Foxboro Co., Dept. CP, 174 Neponset Ave., Foxboro, Mass. . . . or for more information about manufacturer's product, reader may simply check CP 5678 on convenient Reader Service slip which is located opposite last page.)

★ ★ ★  
"THAT'S INTERESTING"

**A-bomb blast, soft breeze  
measured by gage**

A miniature pressure gage for measuring blasts of nuclear explosions or gentle breezes has been developed by Armour Research Foundation of IIT in Chicago. The "business end" of this tiny instrument is only one-eighth of an inch in diameter.



## ASHCROFT GAUGES

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT  
MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, Stratford, Conn. 'HANCOCK' VALVES, Watertown, Mass. 'CONSOLIDATED' SAFETY RELIEF VALVES, Tulsa, Oklahoma. AIRCRAFT CONTROL PRODUCTS, Danbury & Stratford, Conn. and Inglewood, Calif. 'SHAW-BOX' AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, Muskegon, Mich.

When inquiring check CP 5679 opposite last page

# NEW! ASHCROFT 2 1/2" GAUGE

**HAS TYPE 316  
STAINLESS STEEL SYSTEM  
TO WITHSTAND  
CORROSIVE CONDITIONS**

High resistance to corrosion and sustained high accuracy are combined in this new heavy-duty Ashcroft Gauge. The 2 1/2" dial size makes this compact instrument ideal for small tanks and processing equipment where large pressure gauges would be impractical. Bourdon tube (welded at socket and tip) . . . square shank and 1/4" male N.P.T. bottom connection . . . geared movement—the entire gauge system is Type 316 stainless steel.

Made in standard graduations from 30 psi through 1,000 psi, this new Ashcroft Pressure Gauge has a black dial with easy-to-read white figures. The drawn steel case and threaded ring are finished in black. Pointer is precision needle type. Every part is designed, tested and manufactured to meet rigid service conditions.

**YOUR INDUSTRIAL SUPPLY DISTRIBUTOR** now has this new Ashcroft Gauge in stock. Let him know your requirements. You can depend on him for experienced counsel and prompt delivery.

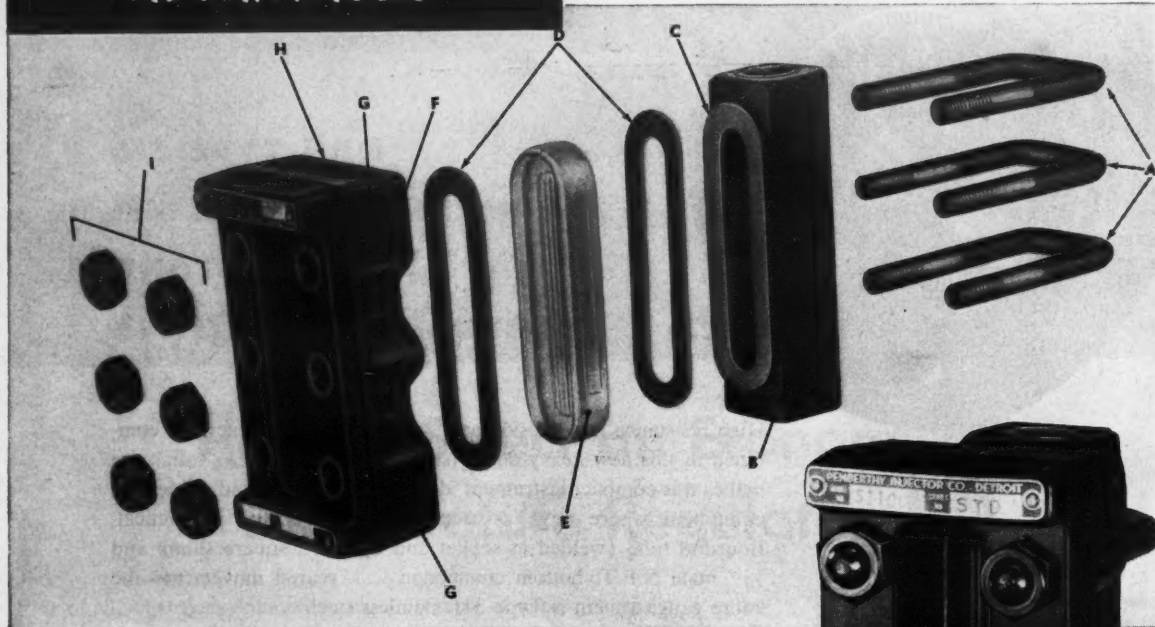
In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

# HERE'S WHY PENBERTHY REFLEX GAGES OFFER EXTRA ADVANTAGES

**CLEAR, ACCURATE LIQUID-LEVEL READINGS**  
in all tanks, boilers, vessels, containers and flow lines.

## PENBERTHY REFLEX GAGES TYPE V & S

- A** Alloy Steel Bolts for high temperature service
- B** Alloy Steel Liquid Chamber heat treated to prevent warping
- C** Raised Face on Liquid Chamber insures perfect self-alignment of frame with glass and gasket
- D** Special Composition Gaskets and Cushions are interchangeable
- E** Resilient Band around glass centralizes it at assembly
- F** Drop Forged Steel Frame extra heavy and rigid
- G** Extra heavy beam at end of Frame (prevents distortion when bolts are tightened to meet high pressure service)
- H** Frame overlaps liquid chamber at all points — provides full backing for the gasket preventing blow-outs
- I** Alloy Steel accurately threaded nuts



## RAISED FACE IS EXCLUSIVE FEATURE

The construction of a Penberthy Gage invites comparison to prove superiority. Note especially the easy glass or gasket replacement and glass cleaning made possible by the fully accessible RAISED FACE. Perfect alignment of frame with glass and gasket is assured. Gasket surface can be repaired without removing assembly from vessel.

Designed for temperatures ranging from sub-zero to over 1000° F. and for test pressures exceeding 15,000 psi., Penberthy gages are used extensively for liquids ranging from water to highly corrosive and dangerous chemicals.

Available in a wide variety of materials including bronze, iron, carbon steel, stainless, monel, etc.

WRITE for Catalog No. 35. Order through your jobber or direct.

### PENBERTHY INJECTOR COMPANY

Division of the Buffalo-Eclipse Corporation

1242 Holden Avenue, Detroit 2, Michigan

There's Certain Satisfaction in **PRODUCTS BY**

**PENBERTHY**

- GAGES
- EJECTORS
- EDUCTORS
- EXHAUSTERS
- SYPHONS
- ELECTRIC SUMP PUMPS
- CYCLING JET PUMPS
- INJECTORS

## INSTRUMENTATION

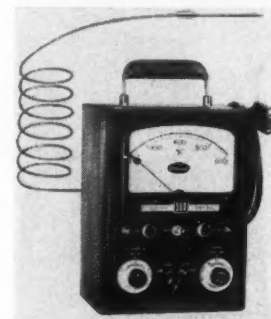
**Using thermistor as sensing unit, controller gives proportioning or on-off control . . .**

handles up to 10 amp directly or larger loads with suitable relays

**Uses:** For accurate control of laboratory or process temperatures.

**Features:** By means of selector switch, instrument can be used as either straight on-off or time-proportioning controller. Manufactured both as an industrial and portable laboratory model, unit operates in range of 0 to 600°F.

**Description:** Thermistor element in sensing probe is hermetically sealed in glass which, in turn, is encased in stainless steel tube 3/16" in diameter.



Control circuit is independent of indicating circuit, so that control accuracy is maintained should indicating circuit become inoperative. Instrument response accuracy is within 0.25% of full scale. Two calibrated adjusting knobs permit control bandwidth to be increased from

minimum value to any desired range.

When used as proportioning controller, unit energizes heater circuit for some fraction of each 15-second interval in proportion to difference between system temperature and setpoint temperature of controller. Series 560 controller operates on 115v, 60 cy AC but accuracy remains unaffected at any line voltage between 95 and 130v. Controller handles up to 10 amp directly and larger loads with suitable relays.

(Series 560 controllers are a product of Fenwal, Inc., Dept. CP, 243 Pleasant St., Ashland, Mass. . . or for more information check CP 5681 on handy form opposite last page.)

**Tests insulation resistances up to 200,000 megohms at 10,000 volts**

**Uses:** Designed for testing insulation resistance on generators, transformers, cables, and bushings. Units may be used for making time-resistance (dielectric absorption) tests on apparatus which has relatively high 10-minute insulation resistance values.

**Features:** Built-in power supply can be plugged

When inquiring check CP 5680 opposite last page

## INSTRUMENTATION

into any 110v, 60 cy AC circuit. One model instrument measures resistances up to 200,000 megohms at 10,000v.

**Description:** DC power supplies for both models use selenium rectifiers and constant voltage transformers. Moving parts are equipped with vibrators to reduce pivot-to-jewel friction. Automatic discharge switches are so arranged that when AC input switch is either switched off or supply plug withdrawn from receptacle, line and earth output terminals are automatically short circuited through current-limiting resistance. This safety feature provides positive means of draining geometric capacitance charge from specimen at completion of test.

Ranges of instruments are as follows: up to 100,000 megohms at 5000v with 1000v and 2500v intermediate ranges; second model, to 200,000 megohms at 10,000v with no intermediate voltage ranges. Units measure  $23 \times 12 \times 10\frac{1}{2}$ " and weigh approximately 50 lb.

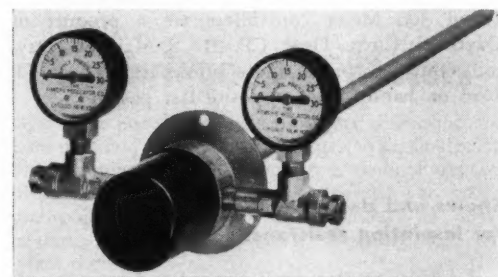
(Megger insulation testers are products of James G. Biddle Co., Dept. CP, 1316 Arch St., Philadelphia 7, Pa. . . . check CP 5682 opposite last page.)

### **Non-bleed pneumatic regulator uses differential expansion to control temperature**

**Uses:** Designed for regulation of heating, cooling, ventilating, air conditioning, dew point control and industrial processes.

**Features:** Temperature range is from 35 to 135°F. Sensitivity can be adjusted from  $\frac{1}{8}$  to 2 psi per one degree temperature change.

**Description:** Outside diameter of unit is  $1\frac{3}{4}$ ". Average bulb length is 18" with  $\frac{3}{8}$ " pipe or flange connection. Units are available with direct action only — passage of air pressure is increased

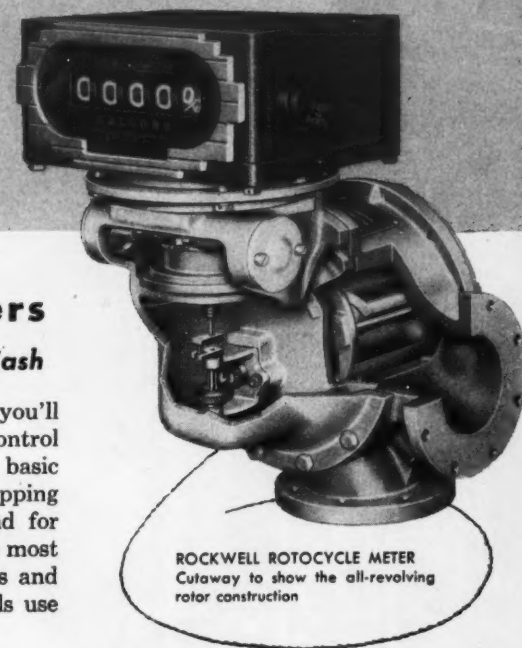
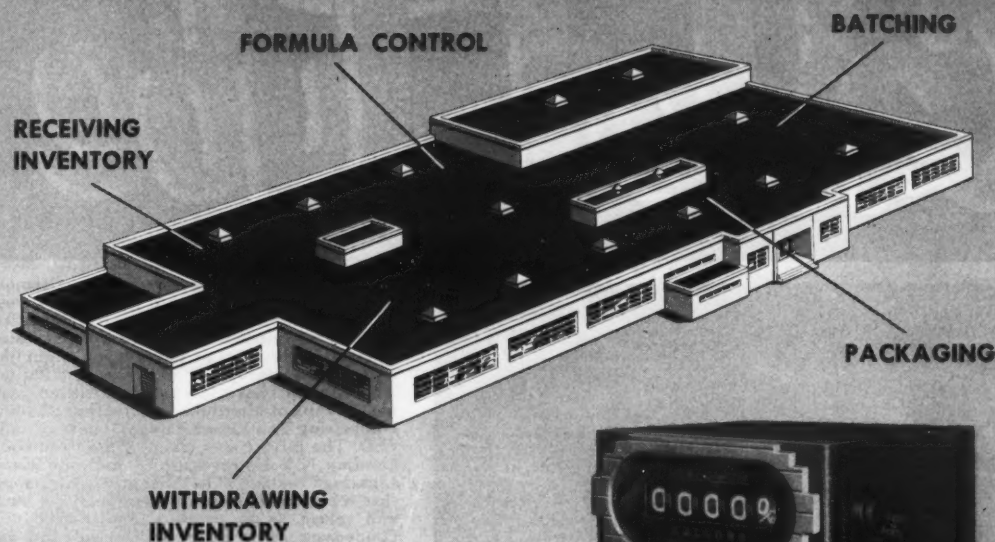


Temp range can be adjusted by concealed dial

as temperature rises. Controller will operate diaphragm valves, damper motors, and blowers.

(Limitim temperature controllers are products of Powers Regulator Co., Dept. CP, 3400 Oakton St., Skokie, Ill. Check CP 5683 opposite last page.)

## Accounting at Every Liquid Handling Point



ROCKWELL ROTOCYCLE METER  
Cutaway to show the all-revolving rotor construction

## Rockwell Industrial Meters

### **Guard Your Liquids as You Guard Your Cash**

Put Rockwell Industrial Meters to work. Then you'll control your costs . . . control your processes . . . control your end product quality. Rockwell meters are basic accounting tools for verifying purchases, for stopping losses, for inventory and departmental control and for tax analysis purposes. They will accurately measure most any liquid that can be piped. Available in all sizes and several types for every requirement. For full details use coupon or write.

## "316" Stainless Steel Meter

### FOR CORROSIVE LIQUIDS

This meter, made entirely of type 316 stainless steel is the answer to many a measurement problem in the Food, Chemical, Drug and Industrial Processing fields. It resists corrosion. Made in two sizes rated at 100 and 200 gpm. Quantity control valves, strainers and a variety of registers available. Described in bulletin OG-406.



YOU CAN RELY ON ROCKWELL

CLIP COUPON—MAIL TODAY

|                                    |                           |                  |
|------------------------------------|---------------------------|------------------|
| ROCKWELL MANUFACTURING COMPANY     |                           | Dept. 106 C      |
| Pittsburgh 8, Pennsylvania         |                           |                  |
| Gentlemen:                         |                           |                  |
| I am interested in measuring _____ |                           | (Name of Liquid) |
| Pipe Size _____"                   |                           |                  |
| Working Pressure _____ psi         | Temperature _____ °F max. |                  |
| Max. Flow Rate _____ gpm           | Min. Flow Rate _____ gpm  |                  |
| YOUR NAME _____                    |                           |                  |
| COMPANY _____                      |                           |                  |
| STREET _____                       |                           |                  |
| CITY _____                         | ZONE _____                | STATE _____      |

When inquiring check CP 5684 opposite last page

FOR INSTRUMENTATION AND CONTROL

# Cabled Tube

Some time ago Revere ran an advertisement featuring Crescent Armored Multitube for use in pneumatic and hydraulic instrumentation and control systems. The advertisement created so much interest that we thought you might like to see a photograph of an actual installation. The Control Board Junction Box shown here has 22 runs of Multitube coming into this box comprising 224 Revere Copper Tubes of 1/4" O.D. The picture was taken in the Glenwood Landing, N.Y. Power Station of the Long Island Lighting Company. The tubes go to instruments that report information on temperature, main and reheat steam pressure, boiler feed and condensate pump pressure, fuel oil and gas pressure, liquid levels, tide level and for the control of fuel feed, draft dampers, boiler drum water level and various control valves.

This is a relatively new use for Revere Copper Tube, but it is an important one in these days when new ways are being found to obtain process information more quickly and accurately, or to achieve automatic control. Crescent Armored Multitube is made by Crescent Insulated Wire & Cable Co., Inc., Trenton 5, N.J., in lengths up to 1,000 feet. It consists of a group of long tubes twisted together in cable form, protected by a flexible interlocked galvanized steel armor, or by plastic, or both. As many as 19 tubes, 1/4" O.D., can be cabled, with one tube in each layer color-coded. Larger tubes can also be cabled, including 5/16", 3/8" and 1/2". This construction affords protection during shipment, installation and use, and speeds up installation greatly. For further information, write Crescent, and for tube in copper and aluminum, see the nearest Revere Sales Office.

## REVERE

COPPER AND BRASS INCORPORATED

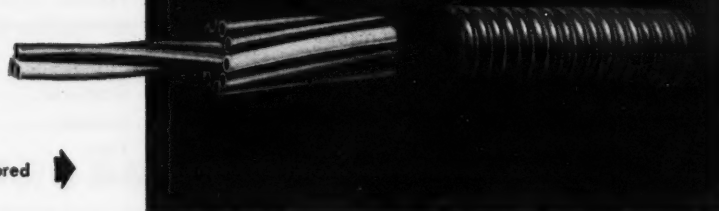
Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

Control Junction Box at Power Station of Long Island Lighting Company, showing use of Crescent Armored Multitube. Note that relatively sharp bends can be made without damage to the cabled copper tube.

Construction of Crescent Armored Multitube.



When inquiring check CP 5685 opposite last page

## INSTRUMENTATION

**Actuates closed-loop system while indicating signals from transducer . . .**

unit has DPDT output relay rated at 5 amp for 115 volts AC



Converts meters into controllers

**Uses:** Indicates any quantity that can be measured electrically. Unit actuates alarms, counters, or closed-loop automatic control system. Instrument couples with displacement indicator and can be actuated by any quantity measurable by differential transformer transducers.

**Features:** Low impedance (40 ohms)

of meter movement allows it to be placed in series with standard movements of recorders with negligible effect on accuracy. Meter may be placed in series with, or substituted for, meter movements of indicating instruments to convert them into controllers or automatic monitors and alarm devices.

**Description:** Controller has automatic interrupter circuit with adjustable time cycle, instant adjustability of limit point, optional manual reset operation, and pilot light showing position of output relay contacts.

Typical specifications include:

|                          |                        |
|--------------------------|------------------------|
| Range .....              | 0 to 1 ma DC           |
| Maximum burden .....     | 0.04 mw                |
| Interrupter cycle .....  | 1/2 to 15 sec          |
| Output relay .....       | DPDT, 5 amp, 115v AC   |
| Power Requirements ..... | 105-125v, 50-60cy, 10w |
| Dimensions .....         | 7 x 9 x 8"             |
| Weight .....             | 8 lb                   |

(Mod 360 Meter controllers are a product of Daytronic Corp., Dept. CP, 216 S. Main St., Dayton, Ohio . . . or for more information check CP 5686 on handy form opposite last page.)

**Shows and describes tester for insulation resistance**

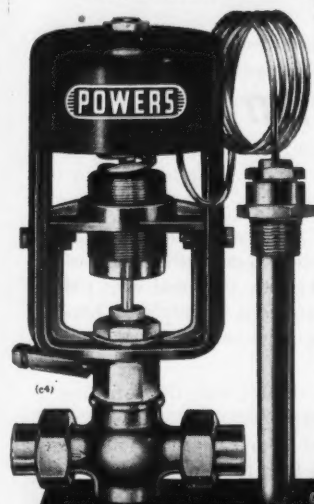
Information and application data for two models of manufacturer's high range insulation resistance tester are presented in 24-page, two-color catalog.

Bul 21-20 is issued by James G. Biddle Co., Dept. CP, 1316 Arch St., Philadelphia 7, Pa. When inquiring specify CP 5687 on handy form opposite last page.

# CUT COSTS

## REGULATE TEMPERATURE OF

WATER AND OIL HEATERS  
VATS • TANKS • DRYERS  
METAL FINISHING PROCESSES  
JACKET WATER COOLING  
AND MANY OTHER USES



### with POWERS No. 11 Self-Operating TEMPERATURE REGULATOR

Easy to Install  
DEPENDABLE • ECONOMICAL  
Controls temperature  
of liquids or air

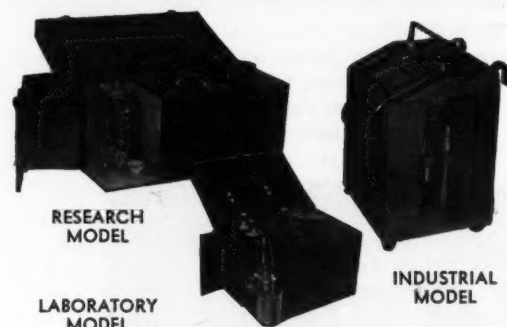
A premium quality regulator with these features that give better control and years of trouble-free service: has over-heat protection; valve stem lubricator helps give more accurate control; reduces packing gland maintenance; OILITE thrust bearing makes it easy to adjust temperature; available, when required, with easy to read 4" dial thermometer.

Write for Bulletin 329

Offices in 40 Cities, See Your Phone Book

THE POWERS REGULATOR CO., Skokie, Ill.  
Over 60 Years of Automatic Temperature and Humidity Control

When inquiring check CP 5688 opposite last page



## Cambridge pH Meters

The three portable models illustrated above incorporate new and important advantages. A.C. line operation eliminates battery nuisance. Laboratory and Research models use electron-ray tube for precise null-point indication. Industrial model is direct-reading, continuous-indicating; ruggedly built for plant use.

**Accuracy:** Research .02 pH, Laboratory .05 pH, Industrial .10 pH. Cambridge pH equipment also includes single- and multi-point indicators and recorders. Send for Bulletin 910-M.

**CAMBRIDGE INSTRUMENT COMPANY, INC.**  
3706 GRAND CENTRAL TERMINAL, NEW YORK 17, N. Y.

**Pioneer Manufacturers of  
PRECISION INSTRUMENTS**

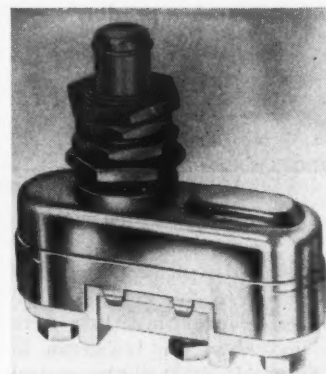
When inquiring check CP 5689 opposite last page

## INSTRUMENTATION

### Switches electrical load over wide range of temps . . .

unit has been tested in range  
of -50 to 1000°F

High-temperature precision switch for panel mounting has been tested in excess of 25,000 operations with resistive load of 5 amps, 28v DC and 700°F conditions. At 1000°F, switch surpassed 9000 operations carrying resistive load of 2 amps, 28v, DC.



Switch has following characteristics: operating force — 10 to 20 oz; pretravel — 0.065 in max; differential travel — 0.010 in max, and overtravel — 0.125 in max.

(Model IHTI is manufactured by Micro Switch Co., Div. of Minneapolis-Honeywell Regulator Co., Dept. CP, Freeport, Ill. . . . or check CP 5690 on handy form opposite last page.)

### Gives specs, capacities of flowmeters

Specifications, capacities, installation diagrams and applications of small feeder for metering and controlling flow are presented in two-page data sheet.

Cat 70-50 is issued by Fischer & Porter Co., Dept. CP, 149 Jacksonville Rd., Hatboro, Pa. Specify CP 5691 opp. last page.

# ROCKWELL-BUILT Edward VALVES

*FOR LOW COST—High Performance*

## Edward GAGE and INSTRUMENT VALVES Are Inexpensive

In small piping Edward Gage and Instrument valves with forged steel bodies insure strength and compactness. Fine stem threads permit accurate regulation and keep the stem from "traveling" under pressure. Perfect alignment of the stems and seats plus centerless grinding of stems give you permanent drop-tight closure. Positive finger tight testing at rated pressures proves tightness of each Edward Gage and Instrument valve. Tapered pipe thread bonnet and "bonnetless" designs insure leakproof construction. These rugged valves cost little; reduce maintenance; give longer, more dependable service.

Always specify Edward. Only Edward Valves Equal Edward Quality and Performance.



Fig. 952

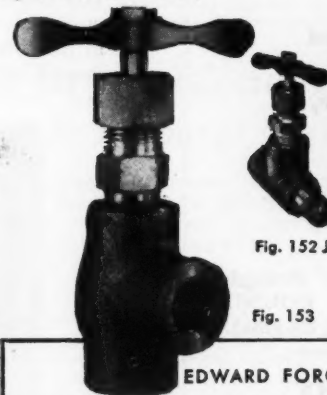


Fig. 152 J

Fig. 153

### EDWARD FORGED GAGE AND INSTRUMENT VALVES

GAGE RATINGS to 4000 lb WOG—Sizes 1/8, 1/4, 3/8, 1/2, 3/4 and 1"

Fig. 152\*—Globe—carbon steel—inside screw—screwed or welding ends.

Fig. 153\*—Angle—carbon steel—inside screw—screwed or welding ends.

\*Fig. 152J and 153J have male inlet and female outlet

INSTRUMENT RATINGS to 6000 lb WOG—Sizes 1/8, 1/4, 3/8, 1/2, 3/4 and 1"

Fig. 952—Globe—carbon steel—OS&Y—bonnetless design—screwed or welding ends.

Fig. 2953—Angle—stainless steel—OS&Y—bonnetless design—screwed or welding ends.

NOTE: Forged bodies in 18-8 stainless and 13% Chromium steel also available.

For more complete details on instrument and gage valves as well as the complete line of Rockwell-Built Edward cast and forged steel valves ask for the Edward Condensed Catalog.

**Edward Valves, Inc.**


Subsidiary of ROCKWELL MANUFACTURING COMPANY

1226 West 145th Street, East Chicago, Indiana

When inquiring check CP 5692 opposite last page

**STOP Corrosion**  
with...

**Van-Cor**  
PLASTIC PIPE, FITTINGS  
AND FABRICATIONS



- ★ Both Chemically Resistant and Impact Resistant Types
- ★ Half the Weight of Aluminum, with High Tensile Strength
- ★ Readily Formed, Machined, Drawn, Molded or Welded

#### AVAILABLE FORMS

SHEETS... $\frac{1}{8}$ " through 1". PIPE... $\frac{1}{2}$ " through 8" diameter (10 or 20 ft. lengths). ROUND BARS... $\frac{3}{8}$ " through 5" diameter (10 ft. lengths). WELDING ROD... $\frac{1}{8}$ " and  $\frac{5}{16}$ " diameter.

#### TYPICAL APPLICATIONS

A rigid non-plasticized polyvinyl chloride, Van-Cor is fabricated into such products as: Ducts, Hoods, Chemical Tanks, Tank Liners, Plating Racks, Fume Stacks and Piping.

WRITE FOR ILLUSTRATED BULLETIN, SPECIFICATIONS, AND NAME OF NEAREST DISTRIBUTOR

INDUSTRIAL DIVISION OF  
**COLONIAL PLASTICS MFG. CO.**

SUBSIDIARY OF THE VAN DORN IRON WORKS CO.  
2685 EAST 79th STREET • CLEVELAND 4, OHIO

When inquiring check CP 5693 opposite last page

## corrosion control

Units in use at Spencer Chemical's catalytic formaldehyde-from-methanol plant have given —

# six years service in pumping low pH formalin

**Added bonus: iron impurities in final product are kept much below specification, giving a premium product**

ROBERT MCKINNEY, Works Manager  
Spencer Chemical Co., Chicago Works  
with FRANK E. McELROY, Assistant Editor

All 22 pumps in the original equipment of Spencer Chemical Company's plant for the catalytic oxidation of methanol to make formaldehyde have given good performance since they went on-stream in January 1949. The Durco Model 40 pumps are used to handle formalin, methanol, and steam condensate.

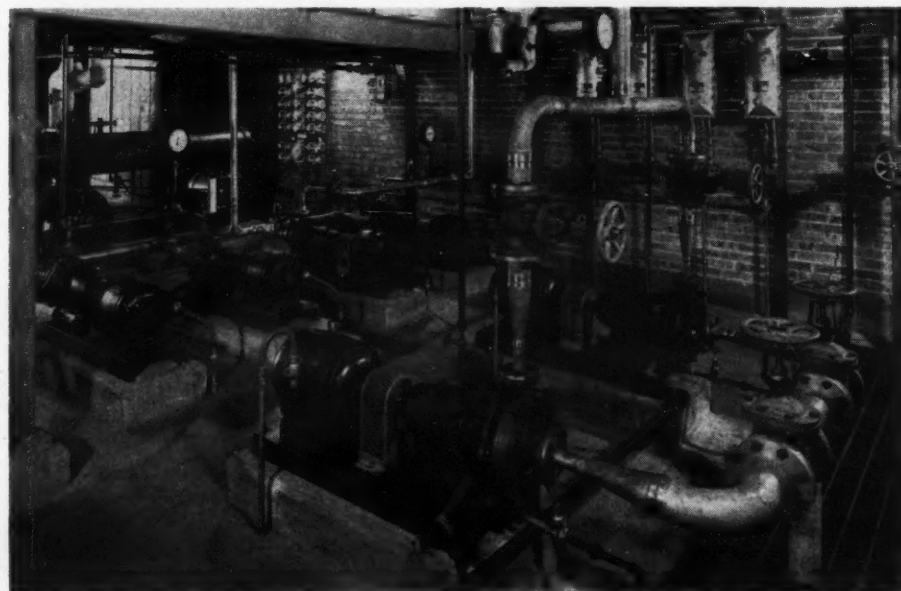
Low corrosion rate of the pumps and other process equipment has cut average iron content to 0.2 ppm in the formalin product. Compare this to the commercial specification of 0.75 ppm (max).

Most difficult application is the truck and tank car loading pumps. These must withstand the action of formalin in concentrations up to 35% and with pH as low as 3.5. Steam condensate is slightly acid, having a pH of 5½-7. The pumps have stood up well during the six year period.

All parts of the pump in contact with the corrosive liquids are made of Durimet 20 stainless steel alloy. Capacity of pumps is 100 gpm against an 80-foot TDH. Suction head is 5½ feet. Packing is the standard material supplied by pump manufacturer. Pumps are powered by a 3-hp motor. Explosion-proof G-E motors and electrical equipment are used throughout the pump room. Piping is aluminum or stainless steel.

Spencer Chemical has an efficient preventive maintenance program. This calls for an inspection of pumps every 30 days and provides for a thorough check every six months.

(Corrosion-resistant pumps are a product of The Duriron Co., Inc., Dept. CP, 450 N. Findlay, Dayton 1, Ohio . . . or for more information check CP 5694 on handy form opposite last page.)



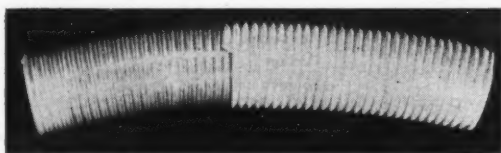
Twelve of Spencer's 22 pumps are shown in this view of pump house. Pumps (from left to right) handle weak formalin, steam condensate, and 35% formalin

**Retains chemical resistance,  
flexibility, durability  
over wide temp range**

**Durable hose combines steel wire and  
two plies of polyethylene in construc-  
tion to provide reinforcement**

**Uses:** Transfer of a variety of chemicals, gases,  
and liquid food products.

**Features:** Polyethylene film used in manufac-  
ture of hose is Visqueen, a product of the Visking  
Corporation, Plastics Division, Terre Haute, In-  
diana. Film contains no plasticizer and cannot  
impart an off-taste to food products. Because it  
is chemically inert, it is not harmed by active cor-  
rosives.



Hose retains flexibility, chemical resistance, and dur-  
ability over wide range of temperatures

**Description:** Flexible hose is made from two  
plies of polyethylene film which enclose a spiral  
of stainless steel wire. Where additional reinforce-  
ment is desired, hose may be armored with flexible  
stainless steel braid or with a heavy plastic. Hose  
is capable of retaining properties of lightness,  
flexibility, chemical resistance, and durability over  
a wide range of temperatures.

(Flexible hose is a product of Plastiflex Co., Dept.  
CP, 2001 Main St., Santa Monica, Calif. . . . or  
check CP 5695 opposite last page.)

#### **Comprehensive catalog on Teflon shapes**

Exact working pressures and temperature ratings  
for Teflon bellows, couplings, and expansion  
joints are given in detailed catalog on Teflon  
shapes. Results of the extensive tests presented  
showed that the service conditions for Teflon  
vary according to the shape in which it is fabri-  
cated.

Catalog also contains data on Teflon rod, sheets,  
tubes, gaskets, back-up and O-rings. Illustra-  
tions, sizes, and price lists are included.

Cat 12-15 is issued by John L. Doré Co., Dept.  
CP, P. O. Box 7772, Houston, Texas. When in-  
quiring specify CP 5696 opposite last page.

# Corrosioneering News

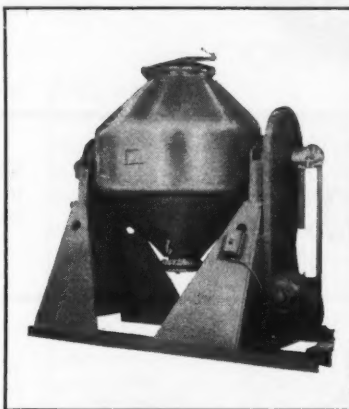
Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.



Published by The Pfaudler Co., Rochester, N. Y.

## Pfaudler announces new UTILITANKS for storage! *Glassed both sides, they won't rust, never need painting*

### NEW PRODUCTS TO HELP YOU FIGHT CORROSION



**DRYER-BLENDER**

New Pfaudler glassed steel conical dryer-blender  
permits drying corrosive products in as little as  
1/5 time previously required. See story below.



**UTILITANKS**

Glassed inside and out with a mild corrosion  
resistant glass, these storage tanks are low in  
first cost and easy to clean. See story at right.

These new low-priced Pfaudler  
UTILITANKS have a smooth, non-  
oxidizing glass surface inside and out.

On the inside, this glass protects  
your product from contamination be-  
cause glass will not oxidize, flake or  
deteriorate with age.

On the outside, the glassed surface  
means you never have to paint the  
tank. It won't rust. Over the years,  
you'll save hundreds of dollars in  
upkeep costs.

#### **Fast, Easy Washing**

Cleaning is easy, too, because Pfaudler  
glass is smoother than the most  
highly polished stainless steel, and  
practically nothing sticks to it. Just  
hose it down.

Beneath these glassed surfaces is a  
rugged carbon steel tank which gives  
you the structural strength necessary  
for day-in, day-out use. The glass is  
not simply a coating or layer of  
enamel—it is actually fused to the  
steel in Pfaudler's furnaces at 1600°  
F. This results in a bond of interlock-  
ing glass and steel so strong that our  
tests could not separate them with a  
pull of over 1500 lbs./sq. in.

#### **Low-Cost Storage**

UTILITANKS are low in cost. We've  
left off fancy gadgets and used glass  
perfectly suited for such products as  
paint, wax, antifreeze, ink, liquid  
sugar, and other neutral products.  
Sizes range from 1000 to 5000 gallons,  
and your initial investment can run  
as low as 50¢ per gallon capacity.

You'll want to see Bulletin 916  
which tells what products may be  
stored in UTILITANKS, what sizes  
are available, what they weigh and  
what features are provided as stand-  
ard. Mail the coupon today.

## New Glassed Steel Dryer-Blender *Does 4 Days' Work in 7 Hours!*

Now you can speed up drying of  
highly corrosive products. New  
Pfaudler glassed steel conical dryer-  
blenders give you the speed of a  
conical dryer plus the corrosion re-  
sistance of acid-alkali-resistant  
glassed steel.

For example, a large manufacturer  
recently began using one of these  
new dryers for a product containing  
acid halides. The new Pfaudler unit  
has reduced drying time of this high-  
ly corrosive product from 4 or 5 days  
to 6 or 7 hours!

#### **Less Labor Time**

They saved most of the time previ-  
ously spent in handling trays of vacu-  
um tray dryers. Filling and emptying  
a Pfaudler conical dryer-blender is  
quick and easy. It has a 1½-foot  
diameter opening for filling, and a  
single 8" discharge nozzle.

When in use, the dryer slowly re-  
volves, tumbling its contents and  
quickly providing an evenly blended,  
evenly dried product.

To speed the process, heat is ap-  
plied throughout the jacket by hot  
water, vacuum steam or pressure  
steam, and a vacuum exhaust con-  
stantly draws off vapors.

#### **Freedom of Use**

You can use Pfaudler conical dryers  
for every acid except hydrofluoric,  
and for alkalis up to pH 12 at 212° F.  
Thus you get the same flexibility you  
are already familiar with in Pfaudler  
glassed steel reactors, heat exchang-  
ers, columns and other equipment for  
tough corrosion jobs.

These dryers range in volume up to  
150 cu. ft. working capacity. They are  
available in four different diameters:  
2-ft., 4-ft., 6-ft. and 8-ft. diameters.  
Internal pressures may range from  
full vacuum to 20 psi. Maximum  
jacket pressure 20 psi with full vacu-  
um. Each unit tested to meet ASME  
code specifications.

Send coupon for further details  
about fast moisture-removal with  
Pfaudler conical dryer-blender.

THE PFAUDLER CO.,  
Dept. CP-3 Rochester 3, N. Y.  
Please send data on ☐ UTILITANKS  
☐ Dryer-Blender ☐ Other equipment

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5697 opposite last page

## CORROSION CONTROL

**Applied to low-cost basis metals, nickel plate gives protection to costly alloys . . .**

plating method assures uniform thicknesses, excellent adhesion, zero porosity

Promise of significant savings to chemical, petroleum, and other process companies which are troubled with contamination and corrosion in their production cycles is reported with the recent announcement of industry's largest capacity plant for commercial application of chemical nickel-plating.

Three principal cost-reducing advantages of the process, an adaptation of General American Transportation Corporation's Kanigen process, are said to be: 1) prolonged service life of process and transmission equipment; 2) plating can be applied to inexpensive basis metals; and 3) processed materials remain free of contaminated and corrosive properties.



Worker adjusts solution flow to control plating rate of chemical nickel-plating process

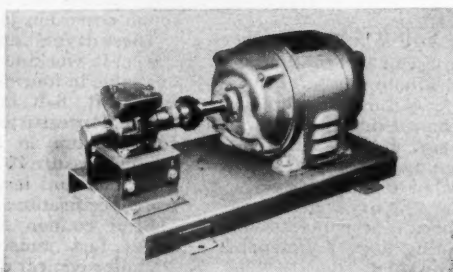
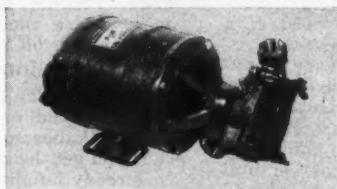
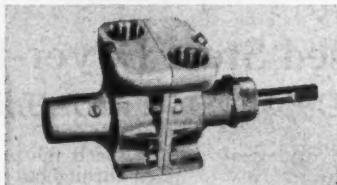
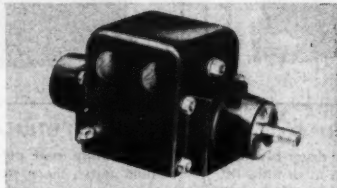
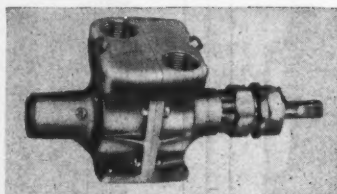
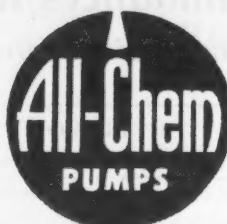
Process can be used to plate any surface, no matter how intricate, with uniform thickness. Even in thin plating thicknesses with less than 1 mil, zero porosity is assured. Thus, base metal remains free from corrosion. Bond of plate is intermolecular. Plated steel shows no flaking or "spalling" even when pulled to yield point. Plate is said to be more corrosion resistant than either pure or wrought nickel in nearly all applications.

(Alcoplate nickel-plating method is a development of American Locomotive Co., Dept. CP, 143 Erie Blvd., Schenectady 5, N.Y. . . . or for more information concerning manufacturer's product, reader may simply check CP 5698 on the convenient Reader Service slip which is located opposite last page.)

## DISPLACEMENT PUMPS

# ECO

## CENTRIFUGAL PUMPS



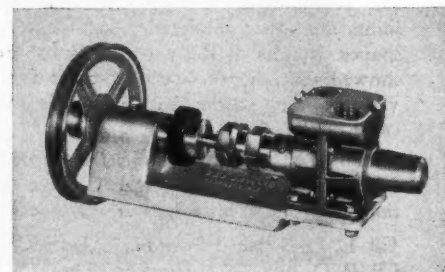
# the big name in

Low volume pumping of corrosives and hazardous liquids requires careful selection of pump designs, capacities, materials of construction and methods of manufacture. The overwhelming field acceptance of the ECO ALL-CHEM for applications requiring a positive displacement rotary type pump with capacities to 10 gpm, and the growing approval of the new ECO CENTRI-CHEM for use where a low cost, high quality centrifugal pump with capacities to 35 gpm is needed, are

### SPECIFICATIONS:

| MODEL                            | CAPACITIES   | IMPELLER   | HOUSING                            |
|----------------------------------|--|--|------------------------------------|
| ECO<br>ALL-CHEM                  | 1/2-10 gpm @ 1750 rpm<br>Temp. to 212°F.<br>Pressures to 100 psi                 | Teflon<br>Hypalon<br>Neoprene<br>Carbon<br>Formica | Type 316<br>Stainless<br>Hastelloy |
| ECO<br>RUBBER-CHEM               | 1/2-10 gpm @ 1725 rpm<br>Temp. to 180°F.<br>Pressures to 100 psi                 | Teflon<br>Hypalon<br>Neoprene<br>Carbon            | Synthetic<br>Rubber                |
| ECO<br>GENERAL PURPOSE<br>BRONZE | 1/2-10 gpm @ 1750 rpm<br>Temp. to 120°F.<br>@ 1750 rpm<br>Pressure to 150 psi    | Neoprene<br>Hypalon<br>Carbon<br>Formica<br>Teflon | Bronze                             |
| ECO<br>CENTRI-CHEM               | To 35 gpm with heads<br>to 54 ft.<br>Temp. to 180°F. for non-<br>volatile fluids | Type 20<br>Stainless<br>Steel                      | Type 20<br>Stainless<br>Steel      |

The ECO ALL-CHEM, RUBBER-CHEM and GENERAL PURPOSE BRONZE pumps are available in all conventional types of mounting and drives.



# small pumps

evidence that ECO's goal of designing and manufacturing a complete line of small pumps especially suited for the process industries has been achieved.

Some of the standard pumps in the ECO line are shown in the chart below. For more complete details on any of the pumps described, or for recommendations on your problems concerning low volume pumping, call or write our Service Engineering Division.



## RUBBER-CHEM GENERAL PURPOSE BRONZE PUMP CENTRI-CHEM

### DESCRIPTION AND USES:

**ALL-CHEM** — This unusually compact, efficient, self priming, corrosion resistant pump is of the positive displacement type, with two axially oscillating impellers similar to duplex piston operation. Rate of delivery is constant and capacity is directly related to speed. Patented design gives linear

fluid delivery without air entrainment, separation, stratification or temperature rise. Delivery is non-surfing, non-foaming. Low in first cost and designed for minimum maintenance, the ECO ALL-CHEM provides reliable low volume pumping for laboratory, pilot plant and production use.

**RUBBER-CHEM** — Similar in design to the ECO ALL-CHEM, the RUBBER-CHEM pump is ideal for handling chlorine bearing fluids, plus many alkalis and organic and inorganic fluids compatible with synthetic rubber. Housings are of

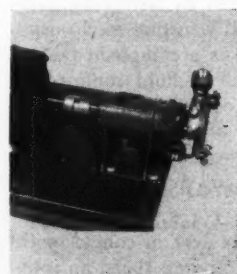
heat resisting synthetic rubber and mechanical packing or rotary seals are available. When specified with Hastelloy components this pump may be used for handling hydrochloric, acids, and bleaching compounds.

**GENERAL PURPOSE BRONZE PUMP** — Identical in design to the ECO ALL-CHEM, the GENERAL PURPOSE BRONZE (Water) pump is recommended for all applications where the fluid being pumped is compatible with the impeller

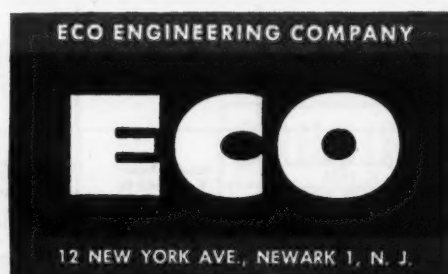
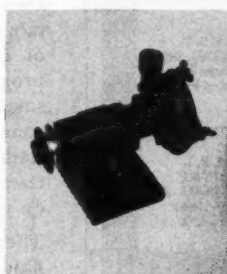
selected and the bronze housing. Extremely low in cost, the GENERAL PURPOSE BRONZE (Water) is ideal for original equipment where efficiency, long life, corrosion resistance and easy servicing are prime factors.

**CENTRI-CHEM** — All metal parts of ECO's efficient, precision built CENTRI-CHEM centrifugal pump are of type 20 stainless steel, the most universally corrosion resistant alloy in standard production. Non-metallic parts are of Teflon or KEL-F. Optionally available is a transparent pyrex end plate which permits visual inspection of the fluids pumped

and simplifies disassembly and cleaning. Pump is fitted with chemically inert mechanical rotary Crane seal. Low in cost yet top in quality, the ECO CENTRI-CHEM is available close coupled to a compact, high quality motor, or pedestal mounted for direct or belt drive.



The ECO stainless steel CENTRI-CHEM pump is available with a pedestal mount designed to permit belt drive or direct coupling with any standard motor or turbine.



When inquiring check CP 5699 opposite last page

## CORROSION CONTROL

**Corrosion, contamination eliminated through use of thermosetting epoxy resin coating . . .**

withstands acids and alkalis at continuous operating temperatures under 230°F

**Uses:** Typical uses include lining for storage or processing tanks and piping, as a coating for materials handling equipment, filter presses, and other processing equipment. It can be applied to most any type of metal to eliminate corrosion and contamination.

**Features:** Lining material shows excellent resistance to chemical solutions having pH range of .3 to 12, with operating temperatures up to 230°F. Surface is extremely abrasion resistant and will not chip or crack.

**Description:** Thermosetting epoxy base coating is sprayed in multiple coats over a freshly sand-blasted surface. Each coat is set up with heat at about 300°F and the final coat is given a special high temperature cure at a maximum of 500°F. A minimum of 5 coats is applied giving an approximate final film thickness of 8 mils. Final surface is smooth, hard, glossy, and easy to clean.

(Lastiglas Gray coating is product of The Bishopric Products Co., Inc., Dept. CP, 4413 Este Ave., Cincinnati 32, Ohio . . . or for more information check CP 5700 on handy form opposite last page.)

**All-molded, seamless valves are of unplasticized polyvinyl chloride**

**Uses:** In corrosive surfaces where plastic pipe and fittings are now being used, or where resistance to corrosion offered by polyvinyl chloride is desired.

**Features:** Plastic used in valves is unaffected by strong or weak organic or inorganic acids, alcohol, and alkalis. In pipe form it has high flow characteristics and will not rust or scale. Its weight is about half that of aluminum. It is highly workable and may be threaded and handled like ordinary pipe.

**Description:** All-molded, seamless valves which are designed and engineered by The Lunkenheimer Company of Cincinnati, Ohio, are made of Boltaron 6200 unplasticized polyvinyl chloride, a product of the Bolta Division of The General Tire and Rubber Company. They are available in IPS sizes 1/4 to 2".

(Boltaron 6200 polyvinyl chloride valves are distributed by H. N. Hartwell & Son, Inc., Dept. CP, Park Square Bldg., Boston, Mass. . . . or for more information check CP 5701 on handy form opposite last page.)

**Want  
to forget  
about  
rust for  
20 years?**

### the Metco\* Systems

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment in a wide range of corrosive conditions. The *Metco Systems* provide for standardization of surface preparation, coating thicknesses and organic aftercoatings for various surface conditions and appearance requirements.

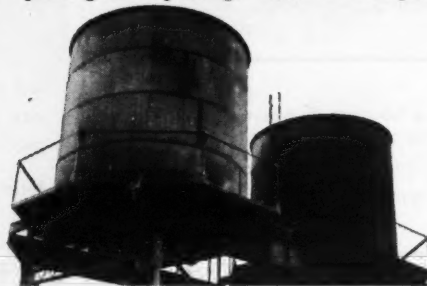
\*Reg. U.S. Pat. Off.—Property of Metallizing Engineering Co., Inc.

Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without *any* further maintenance.

In the chemical field, metallized zinc and aluminum, used with special organic aftercoatings, have proved highly resistant to many corrosives—eliminate undesirable product contamination.

These unique metallic coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Why not find out more how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 93-X—it's free.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.

### here are 11 Metco System contractors

The following organizations are set up to provide positive corrosion protection at lower annual cost in accordance with Metco System specifications. For further information, or copy of descriptive bulletin, contact the Metco System Dept. in the one nearest you.

|  |   |   |   |  |  |
|--|---|---|---|--|--|
|  | Baltimore 30, Maryland<br><b>THE SOUTHERN GALVANIZING COMPANY</b><br>1616 Bush Street<br>Tel. Gilmer 7711                             | New Orleans 13, Louisiana<br><b>GULF ENGINEERING CO., INC.</b><br>1000 South Peters Street<br>Tel. Canal 4421 | Costa Mesa, California<br><b>CLARK METALLIZING, INC.</b><br>636 West 17th Street<br>Tel. Beacon 5527              | Barberton, Ohio<br><b>AKRON SAND BLAST CO.</b><br>50 E. Springfield Rd.<br>Tel. Plaza 3412 | Buffalo 1, N. Y.<br><b>METAL-CLADDING, INC.</b><br>Lakeview & Porter Avenues<br>Tel. Elmwood 9536        |
|  | Philadelphia 29, Pa.<br><b>MW PROTECTIVE COATINGS DIV. OF METALWELD, INC.</b><br>Scotts Lane & Abbottsford Ave.<br>Tel. Victor 8-1810 | Lincoln Pk. 25 (Detroit), Mich.<br><b>DIX ENGINEERING CO., INC.</b><br>1417 Dix Road<br>Tel. Dunkirk 1-8822   | St. Louis 10, Missouri<br><b>ST. LOUIS METALLIZING COMPANY</b><br>625 South Sarah Street<br>Tel. Jefferson 1-5253 | Houston, Texas<br><b>F. W. GARTNER CO.</b><br>3805 Lamar Avenue<br>Tel. Atwood 5338        | Brooklyn, N. Y.<br><b>ARTHUR TICKLE ENGINEERING WORKS, INC.</b><br>21 Delevan Street<br>Tel. Main 5-4200 |

When inquiring check CP 5702 opposite last page

## CORROSION CONTROL

### Technical data on plastic pipe, fittings, and valves

Complete technical data on general-purpose corrosion-resistant plastic pipe with excellent impact strength and toughness are given in six-page bulletin. Properties of the multi-polymer rigid plastic pipe, together with chemical resistance tables, standard sizes, pressures are included. Fittings and diaphragm valves are also covered together with installation and fabrication data.

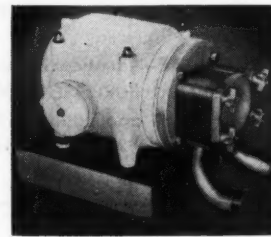
Bul 80-A is available from American Hard Rubber Co., Dept. CP, 93 Worth St., New York 13, N. Y. When inquiring specify CP 5703 on handy form opposite last page.

### Packing glands and shaft seals eliminated in corrosion-proof "squeegee-action" pump . . .

meets requirements of 100% sanitary service; will handle abrasives.

**Uses:** Pumping of food products, pharmaceuticals, or chemically pure fluids.

**Features:** Design of unit eliminates need for stuffing boxes, packing glands, or shaft seals of any sort. This avoids possibility of external leakage, and insures against contamination of product from lubricants or other external sources.



Gentle pumping action of unit prevents churning or foaming of fluid

Pump meets requirements of 100% sanitary service and will handle viscous materials or abrasive slurries that would normally increase shaft seal problems. Highly resistant to corrosion and contamination,

pump's gentle pumping action prevents churning or foaming of fluid.

**Description:** Fluid handled by Sani-Flex sanitary pump is isolated from all actuating mechanisms or rotating parts. Pumping is accomplished by a progressive "squeegee-action" of fluid confined to smooth and polished areas of product zone. This zone includes inside surface of a Type 304 or 316 stainless steel housing and outside surface of a tasteless and odorless neoprene or other synthetic or gum rubber liner.

These are the only two parts ever in contact with fluid, since rotating eccentric pump shaft, an integral part of motor shaft, is isolated within the

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### Dissolv in fuel

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## CORROSION CONTROL

flexible liner. Flanges on liner straddle both sides of housing and offer a complete separation between rotating mechanism and product.

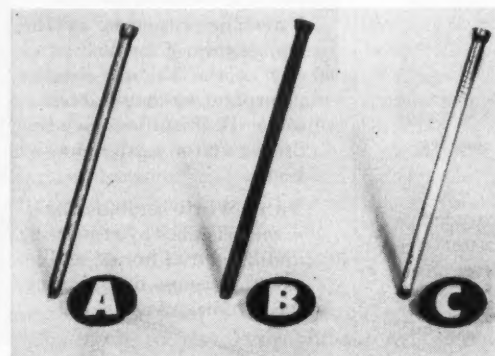
(Sanitary pump is a product of Vanton Pump & Equipment Corp., Dept. CP, Empire State Bldg., New York 1, N. Y. . . or for more information check CP 5704 on handy form opposite last page.)

### **Dissolves sludge, prevents rust in fuel oil storage tanks**

**Uses:** Dissolving of sludge and dispersion of water in fuel oil and prevention of rust in fuel oil storage tanks.

**Features:** In addition to dissolving sludge, additive emulsifies water which gets into oil by condensation or by accident. Emulsifiers used promote wetting of the tank by oil, thus keeping water away and preventing rust.

**Description:** Fuel oil additive causes any water present to be emulsified in oil and kept out of



contact with metal of tank. Photo shows three wire nails from corrosion tests run with sludge solvents. Nails "A" and "B" were tested in a standard solvent and an emulsifier solvent which displaced oil, respectively. Nail "C" is from a test with this fuel oil additive which displaced water, thus wetting metal with oil and preventing rust.

(Sludge Solvent No. 32 fuel oil additive is a product of Montgomery Chemical Co., Dept. CP, Jenkintown, Pa. . . or for more information check CP 5705 on handy form opposite last page.)

### **For ideas on controlling corrosion . . .**

don't miss National Association of Corrosion Engineers' Annual Conference and Exhibition, Palmer House, Chicago, March 7-11.

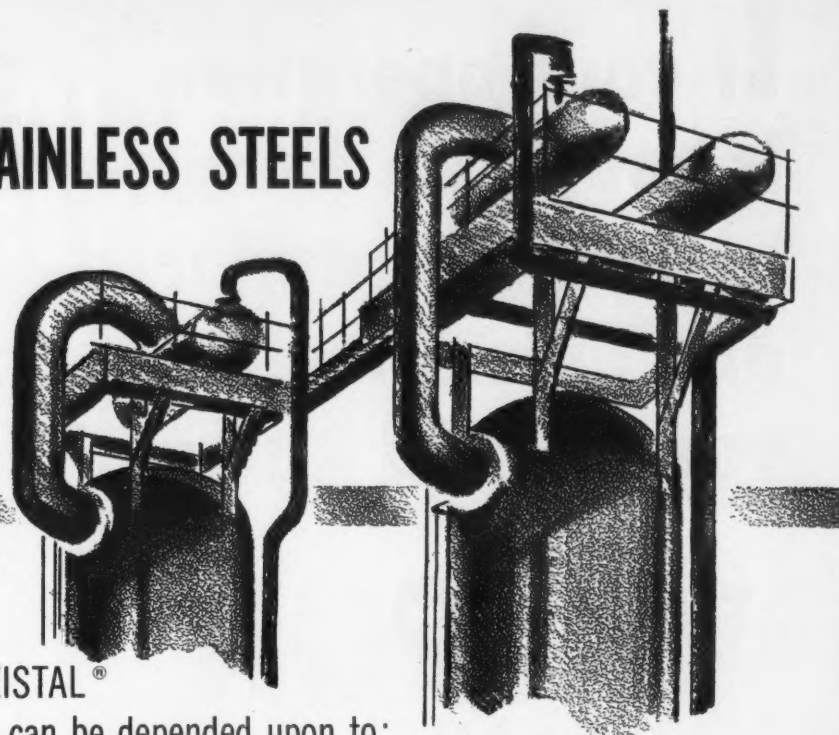
## ... here's how CRUCIBLE STAINLESS STEELS

**serve the  
chemical  
industry**

**all through the  
chemical plant**

**CRUCIBLE REZISTAL®**

**stainless steels can be depended upon to:**



**RESIST CORROSION:** Ordinary air and moisture will not cause stainless to rust. It is almost impervious to attack by oxidizing acids like nitric acid . . . resists strong alkaline solutions. There is a stainless grade to meet most all of your corrosion problem.

**PREVENT CONTAMINATION:** Stainless eliminates rust from entering process materials. And its inert characteristics minimize metallic ions or deterioration residue in the product.

**CLEAN EASILY:** For even the most rigorous cleaning problem — that of decontamination to take off radioactive matter—stainless is chosen far more than other metals. And for most cleaning jobs soap and water does the trick.

**WITHSTAND EXTREMES OF TEMPERATURE:** Stainless resists scaling at high temperatures . . . does not get brittle at low temperatures, as many other metals do.

**PROVIDE GREAT STRUCTURAL STRENGTH:** Stainless is approximately 50% stronger than ordinary mild steel.

**RESIST WEAR AND ABRASION:** Because of the alloy content of stainless steels, mixers, chutes and other process equipment made from them will outlast many times those of other metals.

**ALLOW COMPLEX FABRICATION:** Stainless can be cut, bent, drawn, welded, machined, forged, spun, riveted, cast — fabricated by all the common metalworking processes.

So when you are considering the installation of new process equipment, or the modification of existing facilities, be sure and weigh the advantages of stainless. For practical, down-to-earth help, call Crucible.



Write now for your free copy of "Making the Most of Stainless Steels in the Chemical Process Industries."

**CRUCIBLE**

first name in special purpose steels

54 years of *Fine* steelmaking

**STAINLESS STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

When inquiring check CP 5706 opposite last page

If your operation  
is rough on tanks  
and pipes—interior  
and exterior—then  
you should know

about

**VALPON**  
ENAMEL

MADE WITH **SHELL'S** FAMOUS  
**EPON RESINS**

**Invulnerable to**

OILS { ANIMAL  
VEGETABLE  
MINERAL

AND CAUSTICS...  
with a new measure of  
**resistance to**

**ABRASION, ACID  
& ALKALI SOLUTIONS  
AND CORROSION**



In suitable industrial colors  
and black and white.

If you'd like to know more about  
Valpon, mail your request on  
your regular letterhead to the  
address shown below.



**VALDURA** HEAVY DUTY PAINT DIVISION

**AMERICAN-MARIETTA CO.**  
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 5707 opposite last page

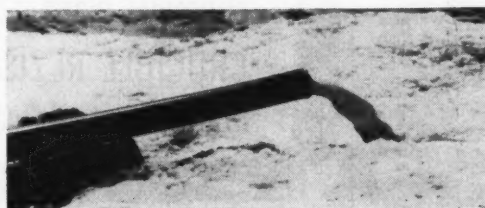
## CORROSION CONTROL

**Bagasse water is disposed  
without harm to plastic  
pipeline . . .**

1500 ft of butyrate pipe withstand corrosion  
in tropic installation

A recent installation of plastic pipe is proving particularly advantageous in handling highly corrosive bagasse water on the International Harvester Company's sisal plantation at Cardenas, Cuba.

Pipeline conducts liquid waste or bagasse water from a decorticator plant, where sisal leaves are processed to obtain fiber used in manufacture of cordage. High acid content of bagasse water causes rapid deterioration of ferrous metals. A wooden pipe system previously used also rotted out. Plastic material, in contrast, resists corrosive effect of liquid and shows no signs of quick breakdown which has heretofore plagued the operation.



Discharge end of plastic pipe line carrying corrosive  
bagasse water

The 4-inch pipe selected for the job is extruded of Tenite butyrate plastic. The bagasse water disposal line runs for approximately 1500 feet, from decorticator to a disposal pit. With the exception of the discharge end at the pit, entire line is underground.

(Tenite butyrate plastic, from which pipe is made, is a product of Eastman Chemical Products, Inc., Dept. CP, Kingsport, Tenn. . . or for more information check CP 5708 on handy form opposite last page.)

**Chromium steels show promise  
for liquid sodium service  
up to 1000°F . . .**

austenitic stainless steels are not subject to mass  
transfer at 1500°F

Chromium-alloy steels containing 12% or more sodium show promise as substitutes for the standard austenitic stainless steels for sodium service up to 1000°F. Research work indicates that they do not undergo mass transfer and do not decarburize. They are somewhat more sensitive to oxygen attack than the austenitic stainless steels, but the difference is not

The **VALDURA** name stands for a complete line of specialized industrial maintenance products designed to serve every type of American industry. Typical products are indicated below. Other Valdura Specifics and Exclusives will be identified in future ads. Watch for them! They can solve your toughest maintenance problems.



**Val-Chem** serves as the perfect primer for Valpon or any of the Valdura finishes incorporating chemical resistance. It provides speedier drying and a vastly superior bond.

**Tank-White** combines maximum resistance to weathering and industrial fumes, and an extra measure of gleaming, prideful beauty.



If you have a particular maintenance problem which is urgent just describe it on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!



**VALDURA** HEAVY DUTY PAINT DIVISION  
**AMERICAN-MARIETTA CO.**  
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 5709  
opposite last page

CHEMICAL PROCESSING

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noticeable below 0.01% oxygen at 1000°F. This is more than most sodium systems can tolerate if oxide plugging is to be avoided. Their diffusion bonding characteristics are still under investigation.

Strong evidence has been accumulated to show that the austenitic stainless steels will perform satisfactorily in regards to mass transfer up to 1500°F. Static tests up to 1800°F do not indicate any great preferential attack tendencies, although instances of intergranular attack of 1 to 2 mils have been reported. At these higher temperatures, scrupulous care must be exercised in regard to oxygen contamination, for sodium oxide generally accounts for adverse preferential attack. Diffusion bonding does occur in the high temperature alloys at 1300°F and any high temperature heat transfer system must take this into account.

Up to 1000°F nickel and nickel base alloys show no mass transfer tendencies, but are somewhat more sensitive to attack by sodium oxide than the austenitic stainless steels.

Hard facing alloys, containing appreciable amounts of chromium, have corrosion resistance to sodium similar to that of the high temperature structural alloys. Caution must be exercised in using hard facing materials containing silicon and boron.

Nickel-molybdenum-chromium-iron alloys have excellent resistance to sodium in static systems. Cobalt base alloys also exhibit good resistance. Of the ceramic materials that have been investigated, alumina seems to be the most satisfactory. Finally, the cermets — and in particular the cemented carbides of tungsten, titanium, tantalum, and columbium nickel, cobalt, or molybdenum binders — have satisfactory corrosion resistance as bearing materials in sodium up to 1000°F, and probably at higher temperatures.

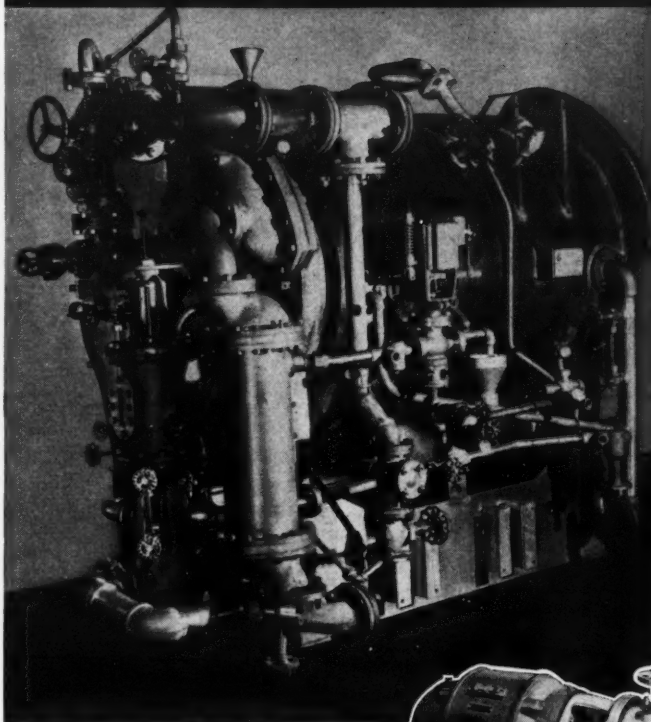
(Condensed from technical paper, "Construction Materials for Liquid Sodium Systems," by E. G. Brush, Knolls Atomic Power Laboratory, General Electric Co., Dept. CP, Schenectady, N. Y. Paper was presented at the 1954 annual meeting of the National Association of Corrosion Engineers in Kansas City, Mo.)

#### Describes low-alloy steels with high strength

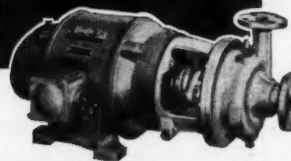
Bulletin of sixteen pages describes a group of high-strength low-alloy steels. Characteristics, corrosion-resistance, how they are formed and worked, and design factors involved in the steels' use are covered. Applications in many fields are given.

Bul A-61 is available from International Nickel Company Incorporated, Department CP, 67 Wall Street, New York 5, New York. When inquiring reader may simply specify CP 5710 on convenient Reader Service slip which is located opposite last page.

## CORROSION PROBLEMS evaporate



Salt water evaporator manufactured by Griscom-Russell Co., Massillon, Ohio. Ampco Metal is the principal component of construction.



Ampco Centrifugal Pumps resist corrosion, abrasion, cavitation erosion.

\*Reg. U. S. Pat. Off.



**AMPco METAL, INC.**

MILWAUKEE 46, WISCONSIN

West Coast Plant: BURBANK, CALIFORNIA

## when you use AMPco\* METAL

*on your tough jobs!*



Hot salt water is a corrosion headache in any man's language. And that's why sea-water evaporators manufactured by Griscom-Russell Co. of Massillon, Ohio are made principally of Grade 8 Ampco Metal.

Ampco Metal has exceptional resistance to corrosion from sea water — even brackish water and polluted harbor-water, as well as many other corrosive liquids. That's why it's so widely used in chemical and process applications as well as marine service.

That's not the only reason Grade 8 Ampco Metal was selected for this tough service: It adapts to complicated shapes — it's easy to fabricate with Ampco-Trode\* welding wire or covered electrodes. Weight is saved — this evaporator is 10% lighter than previous units, with even further weight reductions possible.

Complete the story yourself! Find out how Ampco Metal can help you save production time, trouble, and money — how it gives you corrosion-, erosion-, abrasion-proof service in hundreds of applications.

You get Grade 8 Ampco Metal in practically any form you require: sheets, plates, extrusions, castings, pipe, fasteners, etc. Check with your nearest Ampco field engineer or send the coupon today for more information.

**Tear out this coupon and mail today!**

**AMPco METAL, INC.**

Dept. CP-3, Milwaukee 46, Wisconsin

Send me information of the application of Ampco aluminum bronzes for corrosion-resistant service.

Name.....Title.....

Company.....

Company Address.....

City.....( ) State.....

When inquiring check CP 5711 opposite last page

# TYGON

# Hot Spray

# PAINT

Tygon "ATD" Hot Spray Paint builds a film thickness of 3 mils or more at a single pass—5 mils or more in two coats—a film thickness that would require six or more coats of conventional cold spray vinyl paints. Adhesion is better. Film continuity (because of the thicker and denser film) is immeasurably improved. And, of course, the proven corrosion-resistance of Tygon Paint is in no way impaired.

Tygon "ATD" Hot Spray Paint offers the maintenance man and corrosion engineer a lower cost, surer way to protect plant and equipment against corrosive attack.

- Lower cost— because two coats will do the job of five or six.
- Lower cost— because no thinning is required.
- Lower cost— because of less overspray.

## HERE'S HOW IT WORKS—

Tygon "ATD" Hot Spray Paint is heated in a conventional hot spray heater to a temperature of approximately 160°F. At this temperature, the viscous Tygon "ATD" Hot Spray Paint becomes fluid. Heat does the work of thinners. As the hot paint leaves the gun, the solvents in the paint evaporate, and a high solids content, 3 mil thick protective coating is deposited on the target. Because most of the solvent has evaporated before the paint hits the target, the coating dries quickly. The finish is excellent, without sags or runs. The film is dense, free from pin holes, and resistant to a wider range of corrosives than any conventional protective coating made.

## LEARN MORE ABOUT TYGON "ATD" HOT SPRAY PAINT

*Write today for free literature and detailed information how you can use this lower cost, safer, and better "ATD" way to cut your corrosion losses. Address Dept. CP355*



## U. S. STONEWARE

PLASTICS AND SYNTHETICS DIVISION • AKRON 9, OHIO

55C

When inquiring check CP 5712 opposite last page

## CORROSION CONTROL

**Diaphragm, disc operated separately on lined valve for abrasive, corrosive applications . . .**

large body area plus oversized ports give greater capacities

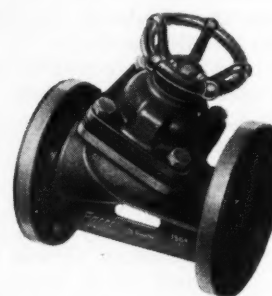
**Uses:** Shut-off, throttling, and control of acids and chemicals in corrosive or abrasive service.

**Features:** In this unit, diaphragm and disc function individually. Thus, sealing the mechanism and seating the disc are accomplished separately. As a result, diaphragm is not subjected to seat wear and abrasion. In severe applications, this makes it possible to close valve in the event of a diaphragm failure.

Generous-sized body areas and over-sized ports are provided in valve, resulting in capacities as much as 50% greater. Ports also permit use of smaller piping with lower pressure drop.

Valve union allows lining to come up over face of union and in contact with union tail piece of special material. For maintenance replacement, valves can be had without tail piece and union nut.

**Description:** Corrosion-proof diaphragm valve, designated X-V Series, are manufactured with bodies of cast iron, 316 stainless steel or Hastelloy



Body of valve can be of cast iron, 316 stainless or Hastelloy "C"

"C". They are available either unlined or lined with same material as diaphragm and disc.

Diaphragms are rubber, neoprene, Kel-F, or Buna-N; discs are of rubber, neoprene, 316 stainless steel, Kel-F, or Hastelloy "C". Sizes range from 1/2 to 4". Connections are flanged, screwed, or union. All valves are designed for

pressures up to 150 psig at temperature of 180°F.

(Corrosion-resistant diaphragm valves are products of Farris Flexible Valve Corp., Dept. CP, 505 Commercial Ave., Palisades Park, N. J. . . . or check CP 5713 opposite last page.)

**Compares clad steels to solid high alloy**

Sixteen standard alloy claddings on a variety of backing steels are discussed in folder.

"Clad Steels vs. Solid High Alloys" is issued by Lukens Steel Co., Dept. CP, Coatesville, Pa. Check CP 5714 opposite last page.



## here's your answer to SEVERE CORROSION PROBLEMS!

• This new bulletin gives you complete technical data on Carpenter ALLOYS B and C Tubing and Pipe—two specialty alloys for "super corrosion resistance" to:

- Hydrochloric Acid
- Corrosive Salts
- Phosphoric Acid
- Sulphuric Acid
- Nitric Acid
- Oxidizing Acid Mixtures
- Chlorine and Hypochlorites
- Organic Acids
- Other Strong Corrodents

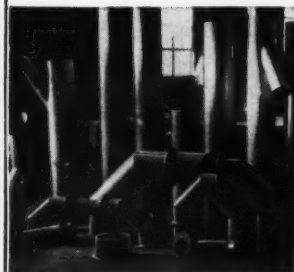
To help solve your severe corrosion problems . . . get this cost-cutting information on physical properties, corrosion resistance, tolerances and available sizes. Write today for your copy of this bulletin on Carpenter ALLOYS B and C to:

### THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N. J.

When inquiring check CP 5715 opposite last page

## IOLYTE Laminated Fiberglass ACID FUME DUCTS



**CUSTOM BUILT  
FROM DRAWINGS  
OR PRINTS  
AT NO EXTRA COST**

**ANY DIMENSIONS  
ANY CURVES  
ANY LENGTHS**

IOLYTE has greater resistance to chemical attack than stainless, Monel, or aluminum. 1/5 the weight of steel, it is superior in tension, flexural, and compression strength. Unlike thermoplastics IOLYTE will not heat-distort below 350 deg.

Stacks, tanks, crocks, dampers, elbows, etc. also fabricated to order. Standard size crocks available in stock.

Send drawings or prints for quotes and ask for literature giving chemical resistances.

### SCHORI PROCESS DIVISION

FERRO CO CORPORATION

8-10 43RD ROAD, LONG ISLAND CITY 1, N. Y.  
FACTORY: 59-31 54TH STREET, MASPETH, L. I.

When inquiring check CP 5716 opposite last page

MARCH, 1955

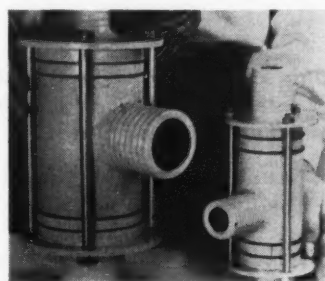
## CORROSION

### Caustic, acid solutions handled by syphon

Uses: Emptying waste acid from tanks and sumps.

Features: Plastic from which syphon is made is not attacked by acid or alkaline solutions except strong chromic or nitric acid. For these acids a unit in Polycam, a Dynel-reinforced polyester resin, is supplied.

Description: Jet syphons are made of Furacam, a fiberglass-reinforced carbon-loaded furfural resin. Nozzles are sized for standard acid hose and unit is easily disassembled for cleaning.



Jet syphon is made of fiberglass-reinforced carbon-loaded furfural resin

Two sizes are available: size #3 has a capacity of 1200 gph and size #6 is rated at 4000 gph with 20 psi steam.

(Camac jet syphons are a product of Carl Buck and Associates, Dept. CP, P.O. Box 267, Essex Fells, N. J. . . . check CP 5717 opposite last page.)

### Data on performance of C-R pumps

Performance curves for various models of vulcanized rubber-lined, stainless steel, and cast steel corrosion-resistant centrifugal pumps are included in eight-page bulletin.

"Centrifugal Pumps" is issued by Industrial Filter & Pump Manufacturing Co., Dept. CP, 5900 Ogden Ave., Chicago 50, Ill. When inquiring specify CP 5718 opposite last page.

Pressure Kettle  
Two-thirds Jacketed  
40 to 200 gal.

Style CW  
Kettle  
Two-thirds Jacketed  
80 to 300 gal.

Style A Kettle  
Two-thirds Jacketed  
5 to 500 gal.

Style B Kettle  
Full Jacketed  
10 to 300 gal.

Vacuum Pan  
50 to 300 gal.

Quick Cooling Pan  
50 to 200 gal.

## REDUCE YOUR PROCESSING COSTS WITH LEE EQUIPMENT

- ✓ **CORROSION-RESISTANT**  
Built from time-proved stainless steel
- ✓ **WIDE RANGE OF SIZES**  
To fit your exact requirements
- ✓ **INDIVIDUALLY DESIGNED**  
To meet your specific processing operation
- ✓ **PRECISION-BUILT**  
To give you long years of peak performance
- ✓ **LOW MAINTENANCE**  
Easy to clean and keep clean

Our technical bulletins describe this equipment in detail.  
*Write for them today!*

## LEE

METAL PRODUCTS CO., Inc.  
418 Pine Street, Phillipsburg, Pa.

ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

Pulp Tank 500 to 2,000 gal.

Mixing Tank 25 to 500 gal.

Storage Tank 100 to 5,000 gal.

Style AST  
Center-Line  
Scraper  
Agitator Kettle  
35 to 300 gal.

Style C Kettle  
Two-thirds Jacketed  
5 to 100 gal.

Style  
CW37  
Center-Line Scraper  
Agitator Kettle  
60 to 300 gal.

When inquiring check CP 5719 opposite last page

## CORROSION ATTACKS EVERYWHERE!

## DEL PROTECTIVE COATINGS STOP CORROSION!

Just as missile NIKE has become a guided protection in America's first line of defense, DEL Protective Coatings offer guided protection from the deteriorating attack of CORROSION, the costly enemy fighting industry today.

DEL Protective Coatings and DEL Synthetic Rubber Caulking Compound offer degrees of protection never before achieved.

At this very moment DEL Protective Coatings are waging war against Corrosion, caused by: **ACIDS, ALKALIES, WATER, OILS, HIGH HEAT, WEATHER, SOLVENTS, ABRASION.**

**PROTECT YOUR PLANT with DEL**  
Vinyls, Acrylics, Synthetic Rubber, Epons, Silicones, Phenolics and other Plastic Resin Coatings and Caulking Compounds.

**WRITE TODAY.** DEL Corrosion Engineers will be happy to make recommendations to counterattack YOUR individual corrosion problems. New 12 page descriptive booklet on DEL Protective Coatings and color card available on request.



There is a  
**DEL PROTECTIVE COATING**  
for every industry!

**DAVID E. LONG CORP.**

220 East 42nd Street, New York 17, N. Y.  
Murray Hill 2-8598

When inquiring check CP 5720 opposite last page

## CORROSION CONTROL

### **Chemical pump's pedestal mount permits belt or direct drive with any standard motor**

**Uses:** Safe handling of antibiotics, viscous corrosives, hydrogen peroxide, aromatic solvents.

**Features:** Previously available only as a close-coupled unit, pump now has pedestal mount designed to permit belt drive or direct coupling with any standard motor.

**Description:** Corrosion-resistant centrifugal pump is manufactured in Type 20 alloy, AC1 CN-7MCu. Mount is single iron casting.

(Centri-Chem corrosion-resistant pump is a product of Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. . . or for more information check CP 5721 on handy form opposite last page.)

### **Ohio State's tests suggest possibility of cathodic protection for stainless handling of fuming nitric . . .**

attack on stainless steel found to decrease with increasing acid flow

Recent research work at Ohio State University suggests the possibility of using cathodic protection to prevent corrosion of stainless steel. Tests were made on Type 347 stainless steel-2S aluminum couples in white fuming nitric acid. Results are striking in that they show almost complete protection of the stainless (corrosion rates of 1 mil per year or less) by the aluminum over a temperature range from ambient to 160°F.

Contamination of the acid with aluminum nitrate resulting from the severe corrosion on coupled aluminum, especially at the higher temperatures, presents a serious problem. This difficulty might be overcome by the use of impressed currents in place of a sacrificial aluminum anode. This aspect is currently being studied from the standpoint of minimum current requirements and resulting acid decomposition.

Another interesting result of the experiments was the decreasing rate of attack shown on stainless steel with increasing velocity of acid flow. Contrary to what might be expected, rate of attack on aluminum tended to increase with increasing velocity of acid flow. Experiments were conducted on both rotating and stationary specimens in a system involving a flowing solution. Acid flow affected only the uncoupled specimens to any appreciable extent.

Uncoupled or control specimens of Type 347 stainless steel are very resistant to fuming nitric acid at room temperature, about 75°F, corroding at a rate of 1 mil per year or less. As temperature is increased, corrosion resistance of alloy is lost and appreciable rates in order of 100 mils per year are encountered

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- ☐ Packings & Seal Cages
- ☐ Gaskets
- ☐ Teflon Stock & Special Molded and Machined Parts

Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5722  
opposite last page

CHEMICAL PROCESSING

at slightly over 100°F. Attack becomes more severe as temperature rises to 160°F, resulting in corrosion rates in excess of 200 mils per year.

The 2S aluminum control specimens show low corrosion rates at all temperatures up to 160°F, corrosion rate at that temp being in 5-10 mil per year range.

(Condensed from technical paper, "Corrosion and Erosion-Corrosion of Some Metals and Alloys by Strong Nitric Acid," by J. F. Willging, J. P. Hirth, F. H. Beck, and M. G. Fontana, The Ohio State University, Columbus 10, Ohio. Paper was presented at the 1954 annual meeting of the National Association of Corrosion Engineers in Kansas City, Mo.)

#### Operate Saunders valve with solenoid pilot for corrosives

**Uses:** Especially suited for tight shutoff control of corrosive liquids and gases.

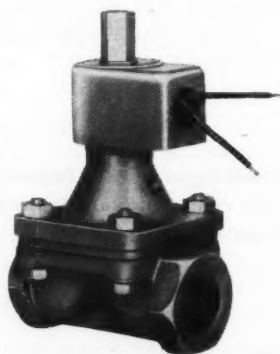
**Features:** Even when solid particle suspensions are handled, valve shuts tightly. They can be used, for example, in regulating pulp or slurry solutions.

**Description:** Valve requires separate operating source of air, water, or oil. Pressure is introduced directly from pilot and impressed on diaphragm (Saunders) to close valve. When solenoid relieves pressure, line pressure forces diaphragm up to open valve.

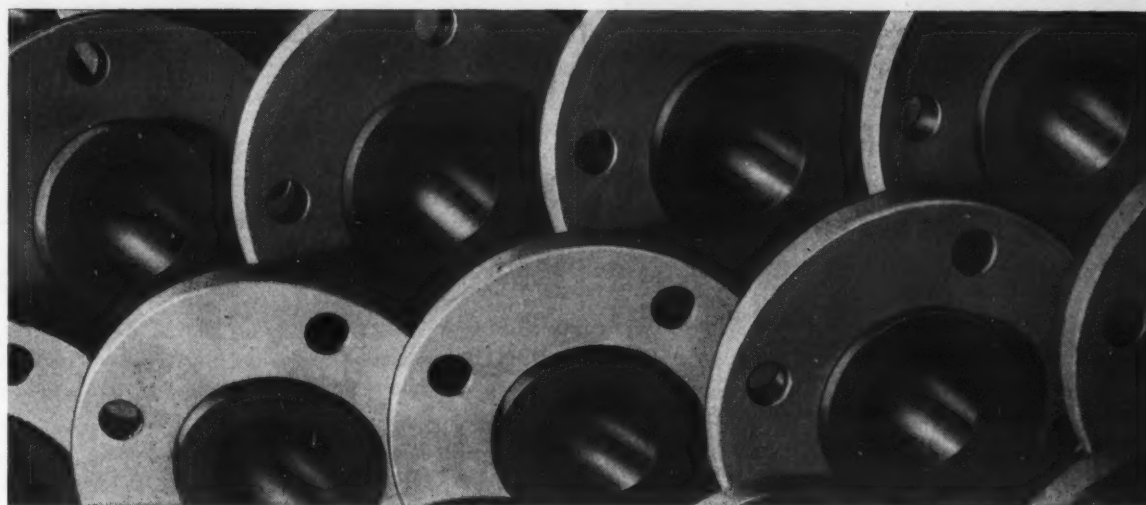
Normally closed or normally open types are available. And either may be changed to the other by reconnecting pilot pressure. Upon loss of separate source pressure, valve fails open. With only two moving parts, valve may be mounted in any position. Wide variety of linings and body materials can be supplied for corrosive problems.

Standard ratings for controlling flow in either direction are 100 psi and temperatures to 180°F. Auxiliary pressures needed are 125 psi (if AC is used) or 50 psi with DC. Overall height of this compact design is seven inches for a one-inch pipe size. Valve sizes range from 3/4 to 2 1/2 inch pipe with flange or threaded connections.

(Bul 8336 Solenoid Valve is a product of Automatic Switch Co., Dept. CP, 391 Lakeside Ave., Orange, N.J. . . . check CP 5723 opp. last page.)



Requires auxiliary pressure source for operation of diaphragm



You can see why

## SARAN LINED PIPE

### GIVES LONG, TROUBLE-FREE SERVICE

**It's made of corrosion-resistant saran pipe swaged into steel for extra rigidity and strength . . . cuts downtime losses conveying corrosive liquids.**

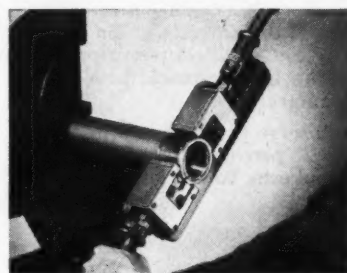
Now you can convey chemicals and many other corrosive liquids without worrying about costly shutdowns due to corrosion. For saran lined pipe, fittings and valves are corrosion-resistant . . . form snug, leakproof joints . . . won't burst under pressure.

They're easily and inexpensively installed because they can be cut and threaded in the field with any standard pipe fitter's tools. Their rigidity means that few supporting members are needed.

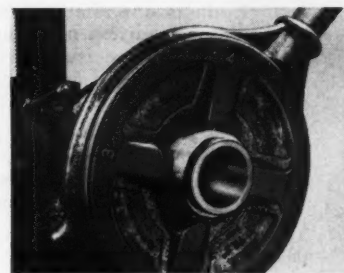
Saran lined pipe, fittings and valves have a proved record in industry of bringing long trouble-free service. If your operation requires superior resistance to most chemicals and solvents, be sure to investigate saran lined pipe. Contact the Saran Lined Pipe Company, Department SP527B, 2415 Burdette Avenue, Ferndale 20, Michigan.

**RELATED SARAN PRODUCTS**—Saran rubber tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

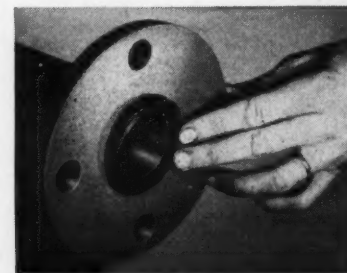
**Saran Lined Pipe Can Be Fabricated Right in the Field!**



A Beaver Cutter cuts away the end of the steel pipe so that 3/8" of the saran lining is extended. This assures a tight seal after a flange is applied and connected with another flange.



A ratchet type thread cutter makes the standard threads after the Beaver Cutter has been used. A flange is then attached and the saran liner filed so its ends are flush with the flange.



A half gasket is used in each flange or whole one can be used in one of the flanges. Then the flanges are joined. The resulting joint is snug, completely airtight and leakproof.

Saran Lined Pipe is Manufactured by  
The Dow Chemical Company, Midland, Michigan

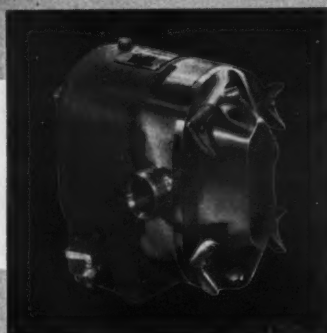
you can depend on **DOW PLASTICS**



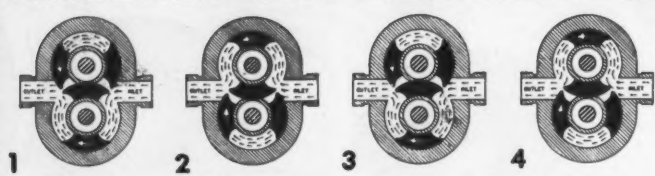
When inquiring check CP 5724 opposite last page

# Whenever corrosive products of high or low viscosity are to be pumped smoothly with a minimum of leakage, the answer is the Waukesha P.D.\* Pump

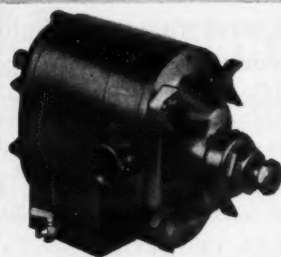
... this sanitary pump ... with positive displacement action guarantees smooth pumping operation.



... is so simple to disassemble, wash, sterilize and assemble. The smooth surfaced O-Ring rotary seal flips out easily and snaps back in place with slight pressure.



The product flow diagram illustrates the position of the twin blade impellers at each quarter turn of the rotors. The four large chambers draw in and discharge four full loads with every revolution. This action is so precise, so closely timed that the product-flow is smooth and even—practically without pulsation.



Waukesha Vented Pumps are easily adjusted for back pressure.

Waukesha Variable-Speed Pump for use with high-temperature, short-time pasteurizers or wherever a variation in capacities is required.



\* Positive Displacement Sanitary Pump.

• Designed for "tough" pumping jobs in the chemical industry where volatile, corrosive or hot materials of low or high viscosity are being transferred, is the Waukesha positive displacement pump with the spring-loaded John Crane rotary seal. This pump and seal combination minimizes leakage problems.

Waukesha positive displacement, corrosion-resistant, stainless steel pumps are renowned for their precision performance and dependable operation. With positive displacement pumping, you eliminate the turbulence, churning, agitation and aeration so damaging to most products. With smooth product flow you reduce your plant processing problems.

Valuable assets where pumps are used to handle various products one after another are these Waukesha features—pumps require a minimum of time to dismantle, clean and assemble; they are easy to wash and sterilize; pump parts are smooth and flush; there are no hard-to-reach, hard-to-clean recesses ... completely sanitary.

Waukesha has a P.D. pump to serve you in the chemical, textile, pharmaceutical, rubber, petroleum, or petrochemical industry. Write the Waukesha Foundry Company, Dept. 3P, for complete details.

## Waukesha Foundry Company

When inquiring check CP 5725 opposite last page

## CORROSION CONTROL

**All-molded PVC valve line comes with matching plastic fittings . . .**

Y-type globe unit is suitable for 125 psi and 150°F temperatures

**Uses:** In corrosive applications, particularly where plastic pipe is now utilized.

**Features:** Base material used for valve is polyvinyl chloride. It is molded in rigid form, suitable for pressures up to 125 psi and temperatures to 150°F. Valve is presently available in a Y-type globe design.

**Description:** Valve, called the Luncor, is molded by a process which gives the PVC material exceptional strength, protects its natural corrosion re-

sistance, and substantially reduces manufacturing costs.

A complete line of plastic fittings made of the same material is also available. These include caps, couplings, plugs, unions, reducing bushings, flanges, 45-degree and 90-degree elbows, and tees.

(PVC valve and fittings are products of The Lunkenheimer Company,

Dept. CP, P.O. Box 360C, Cincinnati 14, Ohio ... or for more information check CP 5726 opposite last page.)

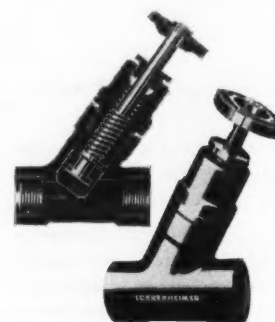
**Handling costs are lowered with rust remover shipped in powder form . . .**

strength of remover can be varied to meet requirements as liquid is added

**Uses:** Removal of rust or corrosive scales from ferrous or non-ferrous metals.

**Features:** Material is shipped in powder form, thus reducing transportation and handling costs and eliminating hazards of shipping in glass containers. Water is added to powder by user and resulting liquid rust remover can be controlled to meet any derusting or corrosion removing requirements.

Dust remover is non-toxic, non-obnoxious, non-flammable, leaves no alkalis and requires no neutralizer. It leaves derusted surfaces metallicly



Sectional (left) and exterior views of all-molded plastic valve

clean with a thin rust-resistant coat, ready to form a bond for paints, nickel or chromium plating, galvanizing, or other protective coatings.

**Description:** De-rusting action of material is fast. Rusted or corroded objects which can be submerged in a liquid bath require only 10 min to 3 hr at room temperature, depending on amount of ferric oxide to be removed. When used as a hot bath, action may be completed in two seconds to 10 min. Solution is effective for removing corrosion from aluminum, magnesium, copper, brass, bronze, stainless steel.

For vertical surfaces and large objects, such as machinery and structures, which cannot be submerged in liquid bath, thickening agent is added.

(Powder Rust Remover is a product of By-Buk Co., Dept. CP, 4314 W. Pico Blvd., Los Angeles 19, Calif. Check CP 5727 opposite last page.)

#### ***Stops corrosion in tanks and ducts and takes hard wear . . .***

flexible lining material resists broad group of chemicals at temps to 160°F

**Uses:** Protecting tanks, fume ducts, and equipment used for mixing, storing, washing, shipping of corrosives.

**Features:** Flexible lining resists corrosive action of common acids, alkalis, salts, plating solutions, organic compounds, nitric, chromic and phosphoric acids — at operating temperatures up to 160°F.

Because material is inherently elastic, thermal expansion and contraction will not crack it. Damaging effects of mechanical abuse are minimized. Good insulating qualities minimize current loss in electrolytic reactions.

**Description:** Designated Vyflex L-10, the thermoplastic lining is based on polyvinyl chloride resins. It is available in either black or white. No curing is required.

(Corrosion-resistant lining is a product of Kaykor Industries, Inc., Dept. CP, 4402 Broad St., Yardville, N.J. Check CP 5728 opposite last page.)

#### ***Standards for standard wall polyethylene pipe***

Commercial standard for dimensions and tolerances for flexible standard wall polyethylene pipe is now available.

Standard CS197-54 may be obtained by remitting five cents direct to Superintendent of Documents, Government Printing Office, Washington 25, D. C.

*At last!*

## **A TRUE VINYL MASTIC!**

### **Complete protection in a single coat—10 mils thick!**

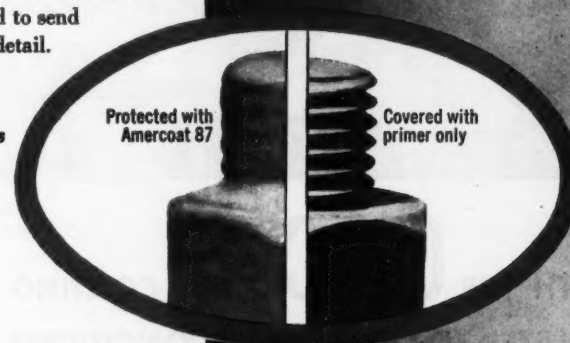
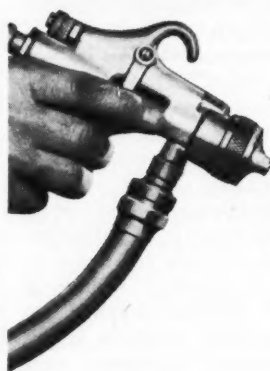
**Amercoat No. 87** will cut your maintenance costs because one coat gives you the thickness and protection previously available only through the application of multiple coats.

**Amercoat No. 87** is the brand new solution to an old problem, for it combines the time-tested chemical and weather resistance of a vinyl with the extra thickness that was heretofore available only in conventional mastics.

**Amercoat No. 87** is easily applied with standard industrial spray equipment. Only one cross-spray coat, over a primed surface, is required for complete protection. Because **Amercoat No. 87** is a true vinyl, it is not limited to black, but is available in a variety of colors.

You can save up to 50% of your labor costs with **Amercoat's new vinyl mastic No. 87**. We will be pleased to send you a bulletin describing this new coating in detail.

**Notice that the sharp bolt threads, welds and sharp corners are completely protected with one coat of Amercoat No. 87—10 mils thick!**

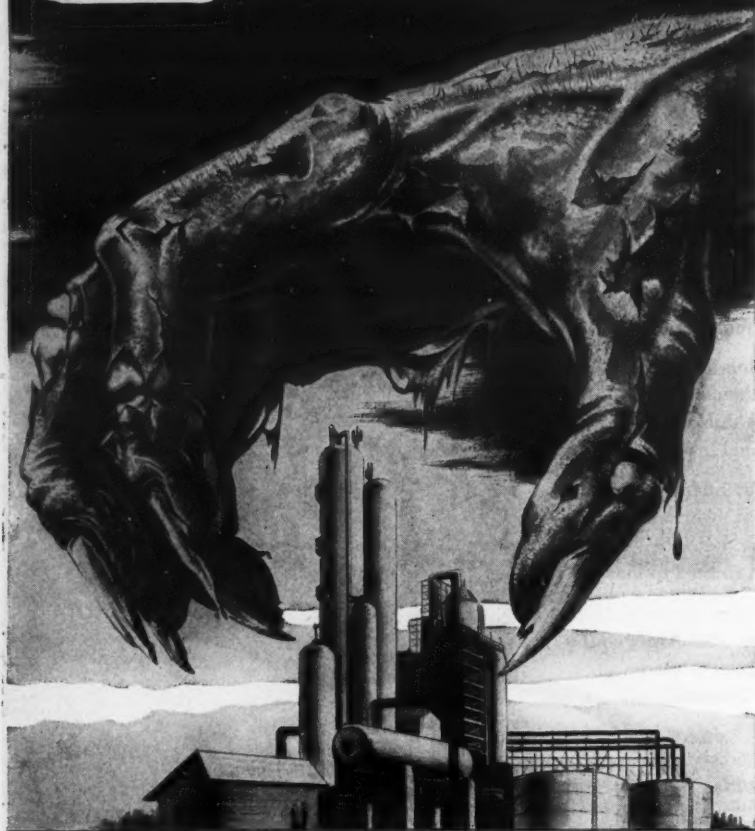


**Amercoat CORPORATION**  
Dept. P,  
4809 Firestone Blvd.,  
South Gate, California

EVANSTON, ILL. • KENILWORTH, N.J. • JACKSONVILLE, FLA. • HOUSTON, TEX.

When inquiring check CP 5729 opposite last page

# STOP COSTLY CORROSION!



1907-CC

## ... WITH THE CEILCOTE COATING BEST SUITED TO YOUR PLANT CONDITIONS

CEILCOTE experience takes the "mystery" out of selecting the proper protective coating. Because no single coating will meet all corrosive conditions, CEILCOTE offers eight different types of organic coatings including phenolics . . . asphaltums . . . gilsonites . . . coal tar . . . epoxys . . . polyesters . . . vinyls and furfuryls.

Because CEILCOTE provides a complete range of laboratory tested and field proven protective coatings, there is no need to compromise . . . there is one particular coating best suited to meet your conditions. Send us the details and our staff of chemical engineers will evaluate and recommend a solution to your industrial coating problem.

Write today for new 8 page brochure (No. 150) giving complete information on base formulation . . . adhesion . . . abrasion resistance . . . chemical characteristics . . . film thickness and cost.



**THE CEILCOTE COMPANY**  
CORROSION-PROOF MATERIAL AND CONSTRUCTION

4834 RIDGE ROAD

CLEVELAND, OHIO

When inquiring check CP 5730 opposite last page

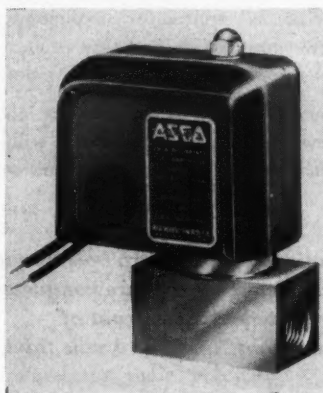
## CORROSION

**Corrosive gases, liquids controlled by stainless solenoid valve**

**Uses:** Controlling gases and liquids generally corrosive to bronze, steel, or iron at pressures to 250 psi.

**Features:** Heavy-duty construction makes valves suitable for operation at a frequency of 400 times per minute. Solenoids are of floating core construction which provides freedom from core chatter.

All internal parts are readily accessible without removing valve body from pipe line. Sterilizing or cleaning can be done by merely removing valve bonnet.



Value is suitable for operation at a frequency of 400 times per minute

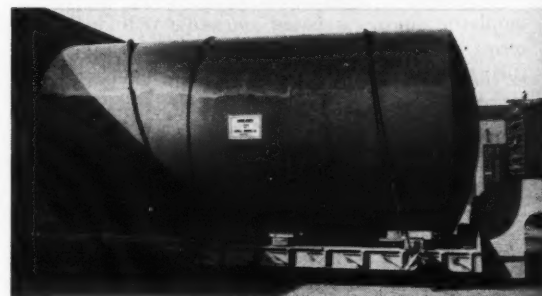
**Description:** Stainless steel, solenoid-operated two-way valves are normally closed (closed when de-energized and open when energized). Continuous-duty Class A coils for temps to 212°F are provided. High-temp Class H coils are supplied for temps to 450°F. Available in 3/8" IPS, solenoid enclosures meet NEMA Standard, watertight requirements.

(Bulletin 8265 Stainless Steel Solenoid Valves are products of Automatic Switch Co., Dept. CP, 391 Lakeside Ave., Orange, N. J. . . . or for more information reader may simply check CP 5731 on handy form which is located opposite last page.)

## Keep Your Equipment Safe from CORROSION AND ABRASION . . .

Corrosion or abrasion can't get a foothold after "RUBBERHIDE" Linings have been processed to the exterior or interior surfaces of metal objects, regardless of their size, shape or service requirements . . . from thumb screws to 20,000 gallon tanks. Compounded from rubber or neoprene to provide proper resistance to the specific corrosive agents involved, or to combat abrasive wear, these modern Linings invariably repay many times their cost through extended life of the products, parts or equipment to which they have been applied.

"RUBBERHIDE" Linings are processed to objects shipped to our Linings Plants in Trenton, Chicago or Houston; or, when the objects are too large for such shipment, or the work involves fixed plant equipment, experienced field crews do the processing "on location". Whether factory or field processed, you can rely on "RUBBERHIDE" Linings for effective, longlasting protection.



Contact Our Nearest Branch for Details



**GOODALL RUBBER COMPANY**

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.  
Branches: Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Denver • St. Paul  
Los Angeles • San Francisco • Seattle • Spokane • Portland • Salt Lake City • Denver  
Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

When inquiring check CP 5732 opposite last page

CHEMICAL PROCESSING

**Corrosion and fatigue failure  
fought by cold-drawn tube  
of wrought iron . . .**

reduces repair and replacement in heat transfer and air conditioning units

**Uses:** In heat transfer apparatus, and for handling salt and brine solutions in air conditioning systems.

**Features:** Wrought iron tubing provides the same protection against corrosion and fatigue failure as does wrought iron pipe. Tubing is manufactured to closer dimensional tolerances than pipe, however.

**Description:** Corrosion-resistant cold-drawn wrought iron tubing is comprised of high purity iron and iron silicate in physical rather than chemical association. Iron silicate occurs in thread-like form throughout high purity iron. This combination gives the metal a strong structure and the slag fibres, numbering some 250,000 per square cross-sectional inch, disperse attack of corrosive forces and prolong life of tubing.

Physical properties of tubing conform to those listed for welded wrought iron pipe in ASTM specification A-72. Tubing is presently available in sizes ranging from  $\frac{3}{8}$  to  $3\frac{1}{2}$ " in OD and in 14 to 8 gage thickness. It is supplied in lengths according to specifications.

(Corrosion-resistant cold-drawn wrought iron tubing is manufactured by A. M. Byers Co., Dept. CP, 1810 Clark Bldg., Pittsburgh 22, Pa. . . . CP 5733 on handy form opposite last page.)

**Repels rust and corrosion  
on red hot surfaces . . .**

silicone, aluminum combined in resistant paint

**Uses:** Applied to surfaces with temps to 1600°F, material will repel rust and corrosion under severest weather conditions.

**Features:** One test, run over a period of 14 months on a pipe carrying air heated to 1600°F, and exposed to heavy rains, showed that coating had resisted oxidation, corrosion, and rust, leaving paint in perfect condition.

**Description:** Formulated of silicone and atomized silver aluminum, coating is long-lasting and economical. It is available in pint, quart, and gallon cans. Single-coat application of this coating is said to protect surfaces for more than a year.

(Sili-Kool hot surface coating is a product of C. H. Dragert Co., Dept. CP, P. O. Box 5092, Dallas, Texas . . . or for more information check CP 5734 on handy form opposite last page.)

**STRUCTURAL  
STABILITY—**

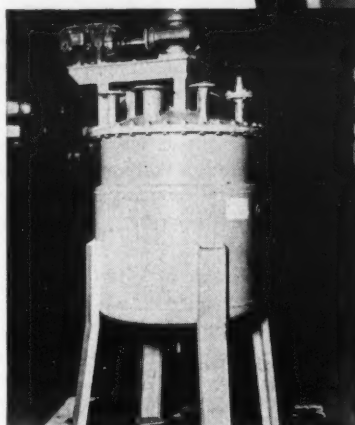
Low-cost carbon steel backing provides necessary strength and rigidity.

**DESIGN  
FREEDOM—**

Integral bond allows design and fabrication of shapes to meet process and space needs.

**ECONOMY—**

High-alloy layer assures corrosion resistance, long equipment life.



*This nickel-clad steel tank processes essential oils, was designed to operate at 100 psi. pressure.*

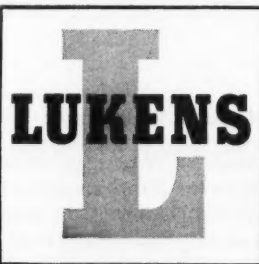
## CLAD STEEL EQUIPMENT GIVES SOLID HIGH-ALLOY PROTECTION AT LOWER COST

Where protection from corrosion, abrasion, and forms of product contamination such as metallic pick-up is a "must", clad steel equipment is often the *economical* answer. Under pressure, vacuum or thermal cyclical service, the high-alloy cladding will not tear away nor will bond failure permit liquid seepage between cladding and backing. If processes change, equipment modifications can be readily made without injuring the clad surface or bond. The smooth contours and joints possible with clad mean easy cleaning and low maintenance, too.

Why pay a premium for protection in your new processing equipment? Lukens Clad Steels—stainless, nickel, Monel, Inconel, copper—give you all the advantages of

these solid high-alloys with savings up to 50% in material costs.

When you're thinking of new tanks and vessels, *qualified* equipment builders can assist from the earliest stages of planning. Working with your engineers and consultants, they know how to help minimize first cost and assure trouble-free equipment life with clad steel. We offer the widest range of clad steels available and work closely with fabricators to help select the type most suited to your processing needs. If you would like further information, ask one of your builders or write Manager, Marketing Service, Lukens Steel Company, 750 Lukens Building, Coatesville, Pennsylvania.



## LUKENS CLAD STEELS

STAINLESS-CLAD • NICKEL-CLAD • INCONEL-CLAD • MONEL-CLAD

PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEEL PLATES AND HEADS AVAILABLE

When inquiring check CP 5735 opposite last page



## Pangborn Dust Control Saves \$14,000 a year for Woodall

The Long Island plant of Woodall Industries, Inc., had a serious problem. Fabricating Masonite for its hundreds of products released so much dust that, without efficient dust control, work would be practically impossible. So Woodall installed a Pangborn Dust Control system.

The result? The dust collected not only leaves the plant dust-free but provides *all* the fuel for heating and processing requirements. Savings on fuel bills amount to \$14,000 a year! Pangborn Dust Control at Woodall pays its own way *with a profit* for the firm.

Pangborn can solve *your* dust problem. Pangborn engineers will be glad to show you how Pangborn Wet or Dry Dust Collectors can save you time, trouble and money!



See how Pangborn benefits varied industries. Write for free copy of "Out of the Realm of Dust," Pangborn Corp., 2700 Pangborn Blvd., Hagerstown, Maryland.

# Pangborn

## CONTROLS DUST

When inquiring check CP 5736 opposite last page

# briefs

from contemporary publications

## Survey of silicones

This eight-paper symposium on silicones deals with their structures and properties, and with their applications in textiles, protective coatings, naval shipboard electrical equipment, and molding resins. Principles for compounding silicone rubbers are stated and silicone oils as lubricants for steel on steel are included. Forty-one pages, 24 tables, 41 figures, 104 references. (*"Industrial and Engineering Chemistry,"* November, 1954, page 2322.)

## Dust collection

In selecting dust collectors one should consider the following properties of the dust: particle size, concentration, abrasive, adhesive, and bridging characteristics, and explosive tendency. Recommendations specific to the ceramic, mining, flour, smelting, plastics, and other industries are made. Six pages, 2 tables, 3 figures. (*"Plant Engineering,"* November, 1954, page 106.)

## Report writing

Practical suggestions for writing reports are given under the headings of facts, organization, presentation, language, and timing. Helpful hints for presenting oral reports are appended. Four pages. (*"Refrigerating Engineering,"* November, 1954, page 49.)

## Mineral wool

U. S. Bureau of Mines reports evaluations of materials for the production of mineral wool. Chemical analyses are supplemented by physical properties. Four pages, 11 tables, 5 figures. (*"Rock Products,"* November, 1954, page 70.)

## Orifices

This study shows that for water the discharge coefficient of an orifice increases with edge thickness if the latter is more than 2.5 per cent of the pipe diameter. Low Reynolds numbers favor increase in coefficient. (*"Instruments and Automation,"* November, 1954, page 1810.)

## Design of fire-dikes

From England come shortcut methods for the design of fire-dikes in connection with the layout of tank farms in the petroleum industry. (*"Petroleum Processing,"* November, 1954, page 1732.)

## Alpha titanium

Investigation of the effects of structure and composition on the mechanical properties of alpha titanium alloyed with nitrogen and aluminum shows that an increase in alpha grain size increases resistance to impact and decreases hardness and strength. (*"Journal of Metals,"* November, 1954, page 1282.)

## Alpha titanium

Lignite, when treated in Bowl pulverizers, can be handled and fired by means of standard equipment intended for bituminous coals. Six pages, 5 tables, 5 figures. (*"Combustion,"* December, 1954, page 38.)

## Water from sewage

By modifying standard procedures one can treat sewage effluent from petroleum refineries to attain satisfactory process water. (*"Petroleum Refiner,"* Nov. '54, p. 165.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service for you . . .

#### Radiation study

In connection with radiation of heat, the relationship between emissivity and angle of emission for roofing asphalt, metals, and paints is presented. Six pages, one table, 5 figures, 5 references. ("Heating, Piping, and Air Conditioning," November '54, p. 135.)

#### Corrosion in a refinery

Concentrations, temperatures, pressures, and velocities of sulfuric acid solutions are considered in this study of corrosion of tanks, pumps, valves, heating coils, and other refinery equipment by acid and acid sludges. Remedial measures are suggested. Twenty-three pages, 12 tables, 33 figures. ("Corrosion," November, 1954, page 368.)

#### Filtration resistance

Results of constant-rate and constant-pressure experiments are presented in a study of the filtration resistance of pulp slurries. Application to drainage on the fourdrinier wire is indicated. Twelve pages, 3 tables, 12 figures, 20 references. ("Tappi," November, 1954, page 523.)

#### Ultrasonic cleaning

From Oak Ridge comes a statement of ten advantages of ultrasonic cleaning for hot cell operations. Design of ultrasonic units is discussed. Two pages. ("Nucleonics," November, 1954, page 65.)

#### Automatic controls

This account of automatic controls in a wallboard plant is supplemented with photographs and a detailed flow sheet. ("Rock Products," December, 1954, page 72.)

#### Entrainment

For 15-inch bubble cap trays, surface tension, liquid and vapor densities, cross-section of column, tray spacing, height of weir, and velocity of vapor are used to correlate entrainment data to within 10 per cent. Entrainment values for Turbogrid trays are given. ("Chemical Engineering Progress," November, 1954, page 565.)

#### Metallic elements in textile materials

In textile materials traces of metallic elements that might escape detection by usual chemical methods can be determined quantitatively by spectrographic analysis. Ten pages, 11 tables. ("Textile Research Journal," November, 1954, page 990.)

#### Burning waste liquors

Methods of burning sulfite, soda, and sulfate waste liquors are covered as are source and preparation of fuels. Charts present viscosity-temperature-concentration data for these liquors and show combustion characteristics. ("Combustion," Nov. 1954, page 52.)

#### How to design data tables

Principles for the design of tables of data for engineering reports are illustrated and discussed. ("Journal of Chemical Education," November, 1954, page 590.)

#### Impregnated glass fabric

This presentation of "sandwich" materials deals largely with silicones and phenolics in plastic laminates and with glass-reinforced plastic laminates. Fabrication techniques and applications are included. ("Materials and Methods," November, 1954, page 92.)

wide open . . .  
or shut tight —  
in a FLASH!



It takes less than a quarter turn to open an Everlasting Valve *wide* or close it *tight*. That's one of the many reasons why these time-proven valves are so popular wherever quick valve action is desired . . . on equipment outlets, storage and measuring tanks, process lines, boiler blow-offs, spray lines, meter testing, etc.

Write for Bulletin E160 describing their many other important advantages and with full information on types, sizes, etc.

For "everlasting" service, use

**EVERLASTING**  
Valves

EVERLASTING VALVE CO.  
73 FISK STREET, JERSEY CITY 5, N. J.

When inquiring check CP 5737 opposite last page

## CUT PACKAGING COSTS

with a  
TRIANGLE  
WEIGHER-FILLER

**FREE  
BULLETIN**

Describes  
Complete Line

Many Models  
to Choose From

▼ If your packaging operations involve the weighing and filling of dry products into bags, boxes, cans or jars—there is a Triangle Elec-Tri-Pak designed to do your job and cut your costs. From low cost table model to automatic, high speed units, there is a versatile weighing and filling machine for every need—for every purse.

Check these Features: Automatic Weighing and Filling • Accurate Finish Weigh • Gentle Handling • Simple, One-man Operation • Low Cost.

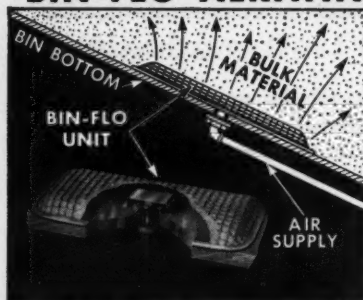
Send for bulletin.

**TRIANGLE** PACKAGE MACHINERY CO.

6660 W. Diversey Avenue,  
Chicago 35, Illinois

When inquiring check CP 5738 opposite last page

## BIN-FLO AERATING UNIT

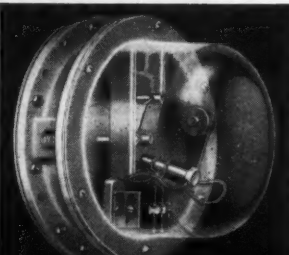


Provides Steady  
Flow of Dry,  
Finely Ground  
Materials which  
tend to bridge in  
storage. Uses  
only small  
amount  
low-pressure  
air.

## BIN-DICATOR BIN LEVEL INDICATOR

For All Bulk  
Materials

signals change in level;  
automatically starts  
and stops filling and  
emptying equipment.



**THE BIN-DICATOR CO.**

13946-D Kercheval • Detroit 15, Mich.

NEW  
DETAIL DATA  
BOOK  
FREE

When inquiring check CP 5739 opposite last page

## packaging



Three parts of the Circle-Seal  
closure are a slip-on rim, disc lid,  
and the can itself

Closures for wide-mouth cans give

*easy access to contents*

Separate identification can be printed on  
rim or lid, reducing inventory problems

**Uses:** As a can closure where wide mouth, easy-to-open-and-reseal lids are required, such as in containers for small quantities of powdered or liquid chemicals, insecticides, agricultural chemicals, or other consumer products whose containers are frequently opened, closed, and reopened.

**Features:** For the packager who has many varieties of a small number of products and uses lithographed cans, the big advantage comes in that only one can in each size need be stocked for each product. Identification of varieties (or other variables such as color, purity, viscosity) is taken care of by using differently-labeled can rims or lids.

Consumer appeal is very high, as the user finds that the can may be opened and reclosed easily and quickly. Raised lid assembly gives more "outage space," makes stirring or pouring easy. Bottom of

can is indented for ease in stacking. On the top of can, raised bosses under the rim take the weight of additional cans stacked on top, so that seals are not affected.

**Description:** Container unit consists of three pieces: can, a disc lid, and a slip-on rim. Lid opens easily. Merely "pop" off rim with a screwdriver or can opener, press center of disc, and remove. The contents pour out cleanly and quickly. The can may be resealed merely by slipping on the disc lid, pressing down the rim over it.

In production-line filling (see accompanying photographs in box at right) the cans are placed on the filling line by an operator. After each is filled a lid and rim are placed on top, and the assembly pressed together under a roller at the end of the conveyor. Disc has a special rubber-base, oil-resistant gasket



At the Sherwin-Williams' Chicago plant, Super Kem-Tone rubber latex paint is packaged in Circle-Seal cans. One girl takes cans from packing box, placing them on line, while second girl puts disc and rim on filled can. Then a roller automatically presses the lid in place

Sherwin-Williams stocks only one model in each of three sizes. For color identification, 26 different rims are used. Other products, Kem-Tone and Kem-Glo, use Circle-Seal cans having different lithography, but a savings is made since many of the color name rims are interchangeable



applied to its under perimeter. Top of disc also serves as an extra area for printing directions, specifications, or other information.

Cans are available in three sizes: half-quart, quart, and gallon. Manufacturer will lithograph cans as desired. A specialty product, these cans cost a little more than the conventional variety that is resealed with much pounding.

(Circle-Seal cans are a product of Can Division, The Sherwin-Williams Co., Dept. CP, 101 Prospect Ave., N.W., Cleveland 1, Ohio . . . or for more information check CP 5740 on handy form opposite last page.)

## Can you name these states?



## There are Continental fibre drum plants in all of them

ANSWERS: 1. New York 2. Pennsylvania 3. Ohio 4. Missouri 5. California

No other company offers you the cross-continent, on-the-spot fibre drum service of Continental. With the opening of our giant new plant in Pittsburg, California, there are Continental manufacturing facilities within easy shipping distance, wherever you do business in the United States.

This easy availability is only part of the Continental service story. When you choose tough, lightweight Leverpak, Stapak, or Fiberpak drums, you have your choice of many sizes, 17 colors, any of 14 inks. Made-to-order linings are available to give your product extra protection. Continental's packaging engineers and research teams stand ready to help you test your shipping methods and to help solve your packaging problems.

For safe shipment of your bulk products, you can't beat Continental fibre drums. For packaging advice, you can't beat Continental service. Why not call on us soon?



**CONTINENTAL © CAN COMPANY**  
FIBRE DRUM DIVISION VAN WERT, OHIO

NEW YORK • PHILADELPHIA • PITTSBURGH, PA. • TONAWANDA • CLEVELAND  
CHICAGO • ATLANTA • ST. LOUIS • SAN FRANCISCO • LOS ANGELES • EAU CLAIRE • PITTSBURGH, CALIF.



When inquiring check CP 5741 opposite last page

## VERSATILE BULK FEEDING... from a trickle to a torrent with VELOFEEDER

A mechanical vibrating feeder especially designed for free-flowing chemicals, fertilizer, pellets and similar materials at lower cost, higher efficiency.

### Here's Why!

**Higher Output**—300 to 50,000 lb./hr. hard granular materials; 300 to 30,000 lb./hr. soft ground materials.

**Lower Power Needs**—1/8 hp. motor powers unit—inexpensive as a 100-watt light bulb!

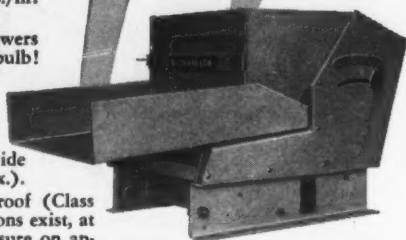
**Smaller Space Needs**—35 inches long, 17 1/2 inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

**Easier Control**—simple adjustment over wide operating range (near 0 to 50 fpm. max.).

**Safer Operation**—motor is explosion-proof (Class 2, Group G), where hazardous conditions exist, at slight extra cost. Complete dust enclosure on application.

**Less Vibration**—working frequency is 1850 vibrations per minute; little or no vibration is transmitted to mounting installation (mounts with only 4 bolts!).

If you're interested in better bulk feeding at lower operating cost, write for Bulletin 5302 with complete specifications and drawing.



## Richardson SCALE COMPANY, Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago • Detroit • Houston • Memphis • Minneapolis  
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal  
Toronto • Havana • Mexico City • San Juan

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 5742 opposite last page

## ALWAYS UNIFORM...

## IN QUALITY

You can't argue with experience, for over 100 years Harrisburg Steel has been producing high quality steel products... so it is only natural they manufacture the best cylinders.

Harrisburg's seamless steel cylinders for high pressure gases range in capacities from 14 to 400 cubic feet... in both Domestic and Export types... to I.C.C. specifications. Harrisburg also offers technical service to solve any problems you have regarding cylinders... just contact our Sales Engineer.

Write today for our Catalog and prices.

HSC-CC-3/54

101 YEARS IN  PENNSYLVANIA'S CAPITAL

## Harrisburg Steel CORPORATION

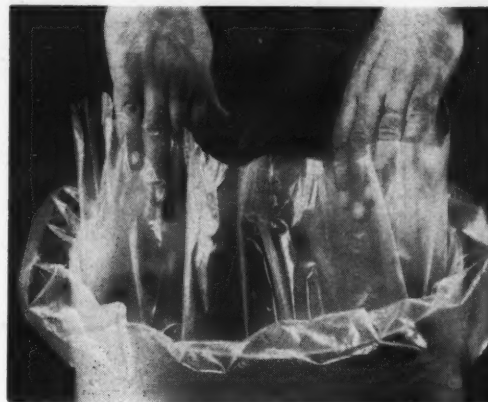
HARRISBURG 24, PENNSYLVANIA

When inquiring check CP 5743 opposite last page

## PACKAGING

**Lighter, cleaner package  
to handle shipments  
of Dow Iodine...**

fiber drum with two polyethylene liners is more convenient, more attractive



Drum pack is easily opened and closed, reduces hazard of spillage

As part of a packaging program which is intended to give more customer satisfaction and provide packages with improved appearance, The Dow Chemical Company has replaced the familiar 200-lb hardwood keg used for many years to ship iodine. The new package is a 10-gal capacity fiber drum having dual polyethylene liners.

This fiber pack is lighter in weight, more attractive, cleaner for handling purposes, and can be opened more easily. Hazard of spillage is reduced to a minimum.

Capacity of this new drum pack is 200 lb net with a tare weight of 7 lb. Package dimensions are 19" high with 12 1/2" diam.

(Information courtesy of The Dow Chemical Company, 1000 Main St., Midland, Mich.)

**Tells how to save money  
when shipping plastics**

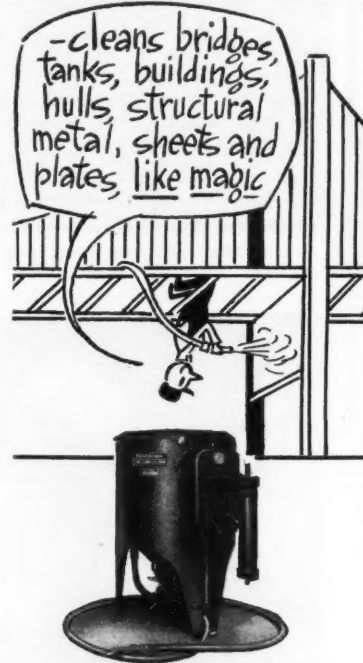
Money-saving questions and answers on packing and shipping plastics are included in 32-page bulletin. Some topics covered are: how to select a container, how to test a container, how to design a container, stacking and loading for shipment, palletizing, warehousing, common carrier regulations. Other topics of interest are presented along with an appendix and reference sources.

Business Executive Series 2 is available from Plastics Div., Monsanto Chemical Co., Dept. CP, Springfield 2, Mass. When inquiring specify CP 5744 on handy form opposite last page.

## PANGBORN BLASTS

by Don Herold

**COST-CUTTING STORY OF THE  
PANGBORN BLAST CLEANING MACHINE**



Pangborn Blast Cleaning Machine—available in six types, stationary or portable—delivers efficient, low cost maintenance in any plant. \$188 up.

For details, write: PANGBORN CORP., 2700 Pangborn Blvd., Hagerstown, Maryland.

## Pangborn

**BLAST CLEANS CHEAPER**  
with the right equipment for every job

When inquiring check CP 5745  
opposite last page

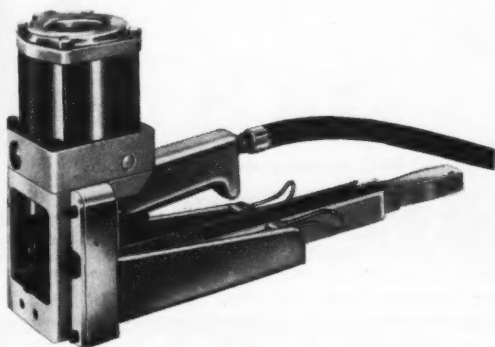
CHEMICAL PROCESSING

**Air motor reduces weight  
of portable stapler  
to 8 lb 12 oz . . .**

also eliminates need for return-cycle air valve

**Uses:** Carton-stapling operations where space is limited or volume doesn't warrant use of larger stapling unit, or where an extra, low-cost unit is needed.

**Features:** Stapler is operated by a two-cycle air motor. Use of air motor has reduced weight of unit to 8 lb 12 oz, as opposed to 24 lb weight of previous unit. Motor also eliminates need for a return-cycle air valve and prevents machine-gun effect of continuous cycling.



Stapler (shown above) has pistol grip with trigger activating switch

**Description:** Portable stapler, designated Model AB-1, is equipped with retractable anvil stapling head with two pivoting anvils that penetrate carton to provide perfect clinching base for entering staple. Adjustable penetration control of both anvil and staple prevents any damage to fragile contents of cartons being closed.

Unit has a pistol-grip handle with trigger activating switch. It operates on 50 psi air pressure. No electrical connections are necessary.

(Portable stapler is a product of International Staple and Machine Co., Dept. CP, 809 E. Herrin Street, Herrin, Illinois . . . or for more information about this product reader may simply check CP 5746 on convenient Reader Service slip which is located opposite last page.)

**For more that's new in packaging . . .**

check the handy product directory (pages 201 to 204.) All the latest products, services, and ideas presented in this issue are listed there.

## Enough to make the difference... ANOTHER HUDSON MULTIWALL FIRST!



Photo left: Actual light tracing photo shows how knife blade or pull and tug method of opening wastes time and product.



Photo right: Snap motion opening — saves time and product.

**Snap-Open®  
MULTIWALL  
SACKS...**

### Provide Speed, Ease, and Economy

The pull and tug days of opening bags are over! Now you can offer your customers the Hudson Snap-Open Multiwall bag... the one bag that opens the fastest, easiest... with just a flick of the wrist... the one bag that guarantees full measure of its contents no matter how fast it's opened.

Engineered by Hudson to meet the demands of the farmer and processor alike, the Snap-Open Sack outperforms conventional opening bags in actual tests... without a trace of spilling. Here is the answer to speed, ease, and savings... with the built-in feature of flow control.

Dealers everywhere are asking for the new Hudson Snap-Open Sacks. Be among the first packaging your product in this newest bag. Allocations for this sensational selling multiwall are being received now. Available in most sizes, call your Hudson representative today, or write Dept. CP3.

Hudson Multiwall Sacks are the only bags submitted monthly to the U. S. Testing Co., Inc. to assure continuous quality of product!



**EXTRA POINTS FOR HUDSON:**

- QUALITY CONTROL from tree planting to sacks. Hudson is fully integrated.
- WRITTEN GUARANTEE your assurance of complete satisfaction in advance.
- RIGID INSPECTION includes a 39-point inspection and test program.
- NON-STOP INK available at no extra cost.
- MODERN PRINTING PLANT for extra display appeal, increased sales for your product.
- SPECIAL SERVICES on delivery, storage and on inventory control problems.
- PROBLEM PRODUCT specialists to study your particular requirements.
- SNAP-OPEN SACKS available to you at no extra cost — comes in most sizes.
- U. S. TESTING CO. is your Independent Certification of Quality.

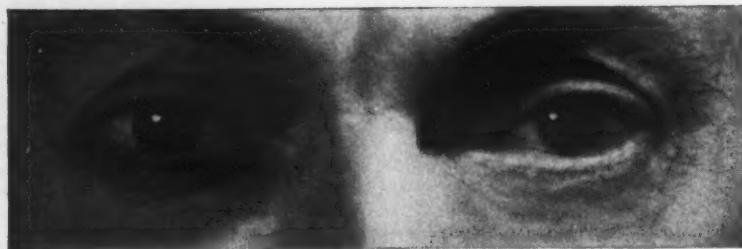
Hudson Pulp & Paper Corp., Dept. CP3, 477 Madison Ave., New York 22, N. Y.

**YES... send us information on your Snap-Open Sack and its sales building opportunities.**

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5747 opposite last page

# Want Proof?



## then trust your own eyes!

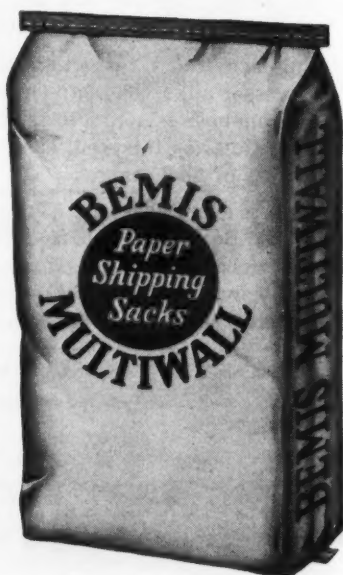
And you will know that Bemis color printing of brands on multiwall paper bags is bright, crisp, color-true . . . the kind that will boost the selling power of *your* brand.

Ask your Bemis Man to show you typical Bemis multiwall printing. Trust your own eyes.

# Bemis



General Offices—St. Louis 2, Mo.  
Sales Offices in Principal Cities



When inquiring check CP 5748 opposite last page

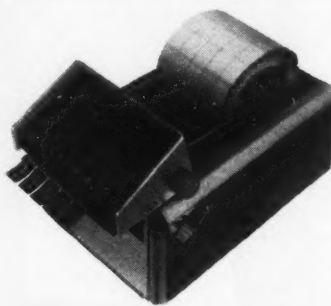
### PACKAGING

**Feeds adhesive labels as fast as needed, automatically . . .**

operator's hands are free to do labeling

**Uses:** Dispensing pressure-sensitive labels, singly or in multiples.

**Features:** Labels are fed as fast as they are removed. Operator's hands are left free to do labeling. No adjustment for varying length of labels is necessary. Unit is automatic with no extra controls, foot pedals, or switches to operate.



Dispenser handles label backing up to 5 1/2" wide

**Description:** Label dispenser, called the Multimatic, handles label backing up to 5 1/2" wide. Unit weighs 12 1/2 lb and is 13" long, 8-3/4" wide, 7 1/2" high. Finish is gray hammertone. It uses 115v, 60 cy AC, 90w with a 30 rpm geared-head motor.

(Label dispenser is a product of Archer Label Co., Dept. CP, 783 Kohler St., Los Angeles 21, Calif. Check CP 5749 opposite last page.)

**Double diaphragm design assures accurate fill to within .001% . . .**

filling unit handles up to 60 55-gal drums an hour

**Uses:** Semi-automatic filling of 30 and 55-gal drums with free-flowing liquids.

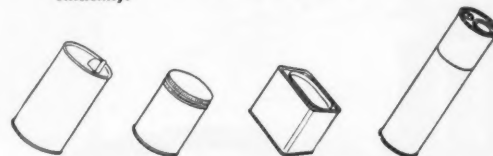
**Features:** One operator can fill 55-gal drums at rate of 60 an hour depending on nature of

## R·C FIBER CONTAINERS

offer you . . .  
**REAL packaging economy and flexibility**

**Because they . . .**

- **can be produced in smaller quantities.**  
no long runs necessary to justify expensive tooling-up and other production costs.
- **labels are easier, less expensive to change.**  
unnecessity of high-cost lithographic plates makes thousands practical instead of hundreds of thousands.
- **cost less to ship.**  
lighter in weight . . . but wilt and sag proof for rugged shipping and shelf wear.
- **offer you faster deliveries.**  
faster to produce—4 convenient factories to serve you quickly, efficiently.



WRITE for further details today

## R·C CAN COMPANY

9430 Page Blvd., St. Louis 14, Mo.

Factories — St. Louis, Mo.; Rittman, Ohio; Turner, Kansas; Arlington, Texas.

When inquiring check CP 5750 opposite last page

## New Line of STAINLESS STEEL PAILS at Big Savings!



**New Welded Construction Equals  
Seamless or Spun**

Entirely stainless (no solder) — smooth surfaces — sturdy 24 gauge type 304 analysis stainless — improved shape for easier carrying, better balance — handles, ears, chimes of heavy-duty stainless. Outstanding quality at lowest cost. Backed by Metalsmiths' 30 years' serving process industries.

**SEND YOUR ORDER TODAY  
PROMPT SHIPMENT**

| LOWEST PRICES — BIGGEST SELECTION ON THE MARKET |             |
|---|-------------|
| 10 qt. -  | \$ 9.25 ea. |
| 12 qt. -  | 10.25 ea.   |
| 14 qt. -  | 11.25 ea.   |
| 16 qt. -  | 12.25 ea.   |
| 20 qt. -  | 13.50 ea.   |
| Discounts in quantity                           |             |



## METALSMITHS

Division of Orange Roller Bearing Co., Inc.

556 White Street

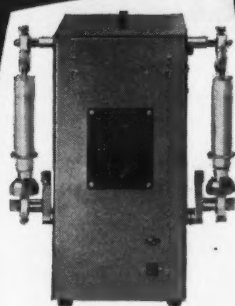
Orange, N. J.

When inquiring check CP 5751 opposite last page

CHEMICAL PROCESSING

- ✓ Fills Vials Two at a Time
- ✓ Meters Liquids
- ✓ Pumps and Circulates

Accuracy to fraction of 1%



Occupies only  
8" x 11" of bench space

The new Filamatic is actually three machines in one. Dispenses .025cc to 50cc per fill. Meters 0.50cc to 3500cc per minute. Pump adjusts for

The NEW  
**Filamatic  
DUPLEX**

**TYPICAL USES:**

- Filling vials, battery cells and pressurized containers.
- Adding flavors to canned foods; perfumes to soaps; vitamins to animal feeds.
- pH control in chemical processing.

continuous or intermittent flow. Features electronic speed control; micrometer volume control; automatic or semi-automatic operation. Low cost-no maintenance expense. Completely portable. Ask your laboratory supply dealer for a demonstration, or

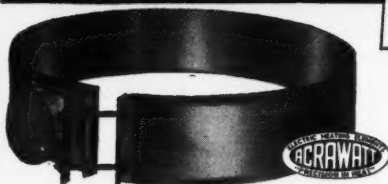
Write for Bulletin D-3

**NATIONAL INSTRUMENT CO.**  
5005 Queensbury Avenue • Baltimore 15, Maryland

When inquiring check CP 5752 opposite last page

## SPEED UP SLOW-FLOW MATERIALS

TARS  
PLASTICIZERS  
WAXES  
MOLASSES  
GLUES  
RESINS  
GREASES  
GUMS . . ETC.



## ACRAWATT ELECTRIC DRUM HEATERS

FIT ALL STANDARD 22 1/4" DRUMS

- Proven Acrawatt THINSTRIP Construction.
- 3 Heats: 3000 Watts 230 Volts.
- Fast Heat Transfer.
- Aluminumized Steel Encased.
- Enclosed Wiring Terminals.
- Low Radiant Loss.
- Fully Insulated.
- Easy to Install and Remove.

Kill time-consuming, costly slow-flow of viscous materials. Slip one or more Acrawatt Drum Heaters on your drums. Make cloggy, sluggish contents get a move on. Go on and off in a jiffy. Safe and simple to apply and operate. Use singly or in multiple. Save with Acrawatt reliability, long life ruggedness and efficiency. Order today.

**FOR BETTER ELECTRIC HEATERS  
AT BETTER PRICES, LET US QUOTE**

**ACRA ELECTRIC CORPORATION**

9913 PACIFIC AVENUE

FRANKLIN PARK, ILLINOIS

When inquiring check CP 5753 opposite last page

MARCH, 1955

## PACKAGING

liquid. Double diaphragm design assures filling to an accuracy of within .001% in 30 or 55 gal.

**Description:** Called the Diaphragm Filler, machine consists of an all-steel, elliptical-shaped filler body which is divided by a double diaphragm. Each side of body is connected to a common 4-way valve. Liquid to be dispensed is directed under pressure through this valve.

This fills body on one side of diaphragm and forces liquid on opposite side of diaphragm through other part of 4-way valve into drum being filled. Since double diaphragm partition can move only to one side or opposite of filling body and is completely restricted from further travel, discharge from either side is identical.

Unit is available with either hand-operated or air-operated controls. It is free of intricate metering devices, and gives maintenance-free, vibrationless operation. Machine weighs 350 lb and is 66" high. For use with corrosive liquids, machine can be made of special materials.

(Drum filling machine is a product of Drum Equipment Corp., Dept. CP, 947 Lehigh Ave., Union, N. J. . . or for more information check CP 5754 on handy form opposite last page.)

## Packaging with plastics

Ideas and developments in packaging with plastics are presented in eight-page booklet. Concise information is provided on a wide range of materials, including company's polyethylene, phenolic, styrene, vinyls, plastics, and resins. Properties and advantages of each plastic are described along with details on color and finish possibilities.

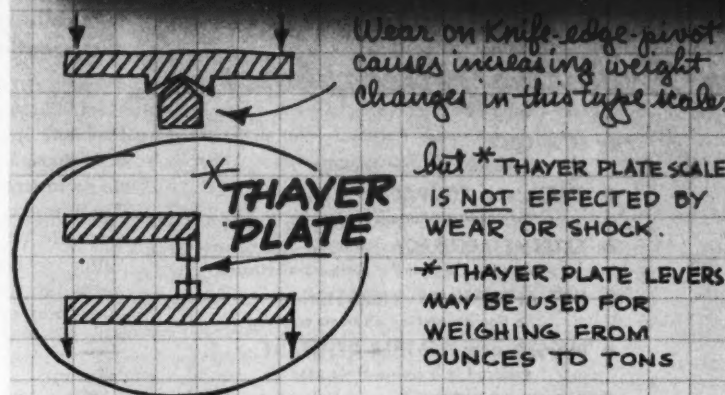
Booklet G-21 is available from Bakelite Co., a Div. of Union Carbide and Carbon Corp., Dept. CP, 300 Madison Ave., New York 17, N.Y. When inquiring specify CP 5755 on handy form opposite last page.

## "NEW-SCALE" ACCURACY

(USING THAYER PLATES)

## after 10 million weighings

(UNDER SHOCK-LOAD CONDITIONS)



**RUGGEDNESS & SIMPLICITY OF CONSTRUCTION  
ELIMINATES MAINTENANCE and PROVIDES  
CONTINUED ACCURATE PERFORMANCE**

*Accuracy  
&  
Sensitivity*

**KNIFE-TYPE  
SCALE SHOWS  
PROGRESSIVE CHANGE**

WEIGHINGS

**\*THAYER PLATE SCALES HAVE BEEN ENGINEERED FOR HANDLING  
ALL TYPES OF INGREDIENTS WEIGHING FROM 3 TO 140 LBS. PER CU.  
FT. TYPICAL MATERIALS INCLUDE ASBESTOS, CHLORIDE SALTS, GLAY  
FLUORSPAR, PHOSPHATE ROCK DUST, GRAINS, DAIRY FEEDS, FERTILIZER,  
FOODS and SPRAY-DRIED CHEMICALS IN BAGS, CARTONS, & DRUMS.**

**Inquire for ENGINEERING SURVEY**

**\*THAYER PLATE PRINCIPLE OF FRICTIONLESS LEVERAGE SYSTEMS  
IS USED UNDER EXCLUSIVE LICENSE AGREEMENT.**

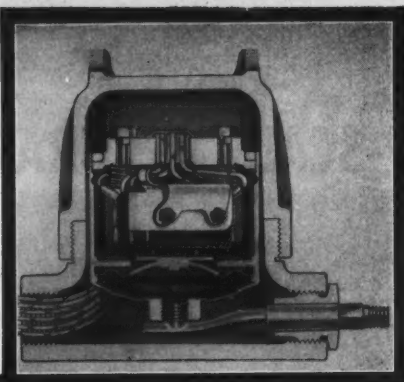
**AUTOMATIC  
BATCHING  
FILLING  
CHECKING**

**THE Thayer  
SCALE**

**THAYER SCALE and ENGINEERING CORP., ROCKLAND, MASS.**

When inquiring check CP 5756 opposite last page

*New Improved*

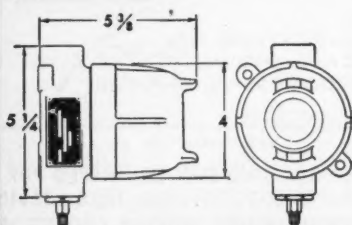


## MELETRON PRESSURE SWITCH for Explosive Atmospheres

- **LOW COST**  
*because of design simplicity*
- **SMALL and COMPACT**  
*for easy installation*
- **EXTREME ACCURACY**  
*moving and wearing parts are eliminated*
- **NOT AFFECTED BY VIBRATION**  
*no liquid switching elements are used*
- **RUGGED and WEATHER RESISTANT**  
*enclosed in a crouse-hinds case*
- **EASILY ADJUSTABLE**  
*by convenient adjusting nut*
- **OPERATES IN ANY POSITION**  
*saves installation time*



**ACTUAL SIZE**



**LIST PRICE \$46.20**

## BARKSDALE VALVES

PRESSURE SWITCH DIVISION  
5125 Alcoa Avenue, Los Angeles 58, California  
send FREE operating and engineering data sheets 920-25

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 5757 opposite last page

## safety

Sharp & Dohme demonstrates that if dust is part of the process . . .

## dust collectors can be part of the processing unit

**Compact collectors eliminate centralized dust collection, and operate only when dust-creating machines are operating**

**Problem:** At the Philadelphia plant of Sharp & Dohme, Division of Merck and Co., one of the major operations is coating of pills and tablets. Tumbling tablets in coating pans stir up a considerable amount of dust. This dust could constitute a major problem if left to float freely about the room. Not only might it irritate throats and noses of workers but it would also contaminate other products.

**Solution:** Compact dust collecting units were installed. These collectors are cabinet type having chemically-treated spark resistant cloth filters. One model employs a 3450 rpm motor and the other model uses the slower 1725 rpm motor.

Each collector services two coating machines. It traps the dust and then exhausts dust-free air back into the building to maintain desired heat balance.

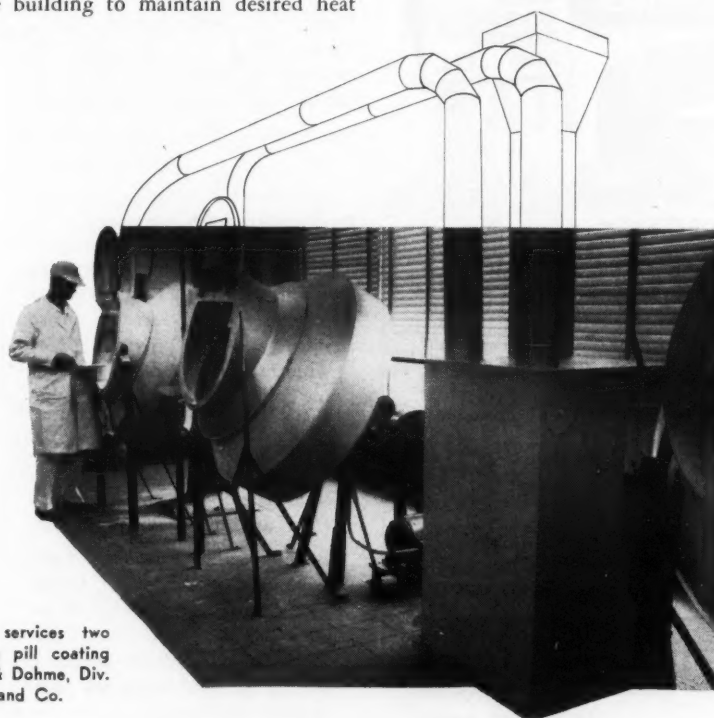
On exhaust of each unit, engineers installed a secondary filter to minimize any dust carryover from collectors.

**Results:** Since collectors have been in use, dust has been eliminated as a possible irritant to workers. Rejects due to contamination have also been cut down.

There is no need for a centralized dust collector and only those collectors operate which are connected to the machines actually creating dust. There is no drain on suction supplied at idle machines.

Besides a savings in power there is less duct work required in the building. This gives the plant a cleaner, less cluttered appearance.

(Dust Collectors are a product of Torit Mfg. Co., Dept. CP, 287 Walnut St., St. Paul 2, Minn. . . or for more information check CP 5758 on handy form, opposite last page.)



Dust collector services two coating pans in pill coating room at Sharp & Dohme, Div. of Merck and Co.

**Single device is resuscitator,  
inhalator and aspirator —  
operates with air**

*Runs efficiently when attached to small  
blower compressed air or oxygen tanks*

Combining the functions of resuscitator, inhalator and aspirator in one device, safety unit can operate



on current from car or truck battery or from ordinary electrical outlet. It uses 110, 28 or 8 volts.

The resuscitator may be operated on positive or negative pressure or negative pressure alone. It has a reducing valve to vent excessive negative or positive pressure.

To convert it to an inhalator requires only a simple adjustment. Facepiece remains in place.

An aspirator is provided for removing mucous or fluid from patient's throat.

There is provision for manual operation of the pulsating mechanical diaphragm to force air into a partly obstructed oral passage.

Unit can be attached to a hospital first aid room, piped air or oxygen system. Where oxygen under pressure is not available, specially designed companion blower can be used with unit.

Supplied without an oxygen cylinder the resuscitator and its aluminum carrying case weigh 10 lb.

The unit has been calibrated for military use for specific treatment of respiratory cases resulting from exposure to Anticholinesterase (nerve gases). Of more practical value is its effectiveness when used with just intermittent positive pressure to treat cases which have been exposed to irritants and fumes.

(Universal Resuscitator is a product of Globe Industries, Inc., Dept. CP, 1784 Stanley Ave., Dayton 4, Ohio. Check CP 5759 opposite last page.)

# ALLEN-BRADLEY TROUBLE FREE STARTERS

**for the CHEMICAL and PROCESS INDUSTRIES**

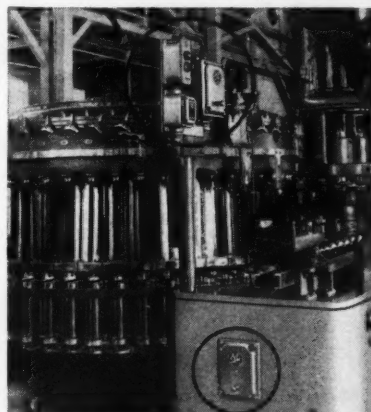
Wherever you find outstanding industrial equipment, you will discover reliable Allen-Bradley motor control. There is a reason!

The simple solenoid design—only ONE moving part—is your reliable guarantee for millions of trouble free operations. When you eliminate moving or wearing parts like pins, pivots, linkages, and bearings, you automatically eliminate possibilities for trouble. Also, Allen-Bradley controls require no contact maintenance. The double break, silver alloy contacts never need filing, cleaning, or dressing. Nor is regular inspection necessary! The contacts are always in perfect operating condition.

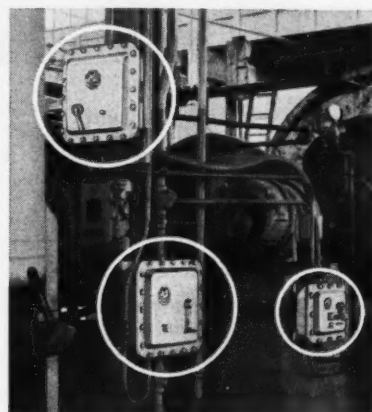
Thus, in explosive, dusty, or moist atmospheres, it pays to install Allen-Bradley starters in the correct enclosure. Because Allen-Bradley solenoid controls do not require regular inspection, time lost in removing and replacing bolted covers is substantially reduced. Ask any maintenance man!

You cannot buy Allen-Bradley control for less money, but its "Quality" will begin to save you money from the time it is installed!

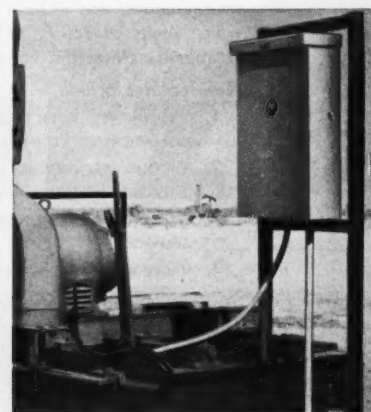
Allen-Bradley Co., 104 W. Greenfield Ave., Milwaukee 4, Wisconsin  
In Canada—Allen-Bradley Canada Limited, Galt, Ontario



Bottle filler operated with Allen-Bradley controls in NEMA 4 watertight enclosures.

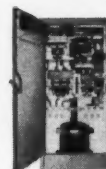


A-B controls in NEMA 7 enclosures for explosive atmospheres installed on ball mill.



In oil field, Allen-Bradley Pump Control Panel in weathertight enclosure.

## Typical Starters



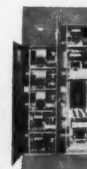
Synchronous Starter



Reduced Voltage Starter



High Voltage Starter



Control Center



Solenoid Starter

*The Sign  
of Quality*



## Allen-Bradley Solenoid Motor Control

When inquiring check CP 5760 opposite last page

# NEW!

## "Varec" 5070 INTERNAL SAFETY VALVE



A quick closing emergency shut-off valve designed to automatically cut off flow out of tank in case of fire. Valve is spring-loaded and is held in open position by a fusible link which melts at 160°F. When this link melts, spring action completely closes the valve.

New features include:

1. VALVE CAGE WITH BOTTOM PORTION CLOSED TO MINIMIZE AGITATION OF SEDIMENT ON FLOOR OF TANK.
2. VACUUM BREAKER INCORPORATED IN PALLET FOR EASE OF OPENING.
3. OPERATING LEVER LINKAGE ARRANGED FOR POSITIVE MANUAL SHUT-OFF.
4. VALVE SEAT FACED WITH STAINLESS STEEL TO RESIST CORROSION.

Standard construction is steel body with bronze valve disc. May be mounted on standard A.P.I. or VAREC Fig. No. 308 Series Tank Shell Nozzles. Available with Series 15 or Series 30 Flanges. Available sizes: 4" x 6", 6" x 8", 8" x 10", 10" x 12" and 12" x 14".

# "Varec"

**VAPOR RECOVERY SYSTEMS CO.**

2820 No. Alameda St., Compton, Calif.

Cable Address:

VAREC COMPTON, Calif. (U.S.A.) All Codes

961-5

When inquiring check CP 5761 opposite last page

## SAFETY

### Powdered charges simplify problem of recharging extinguishers

**Uses:** For recharging any foam extinguisher.

**Features:** Bags are easy to handle, weigh less, and occupy less space than cans formerly used.

**Description:** Powdered foam charges come in two-powder form in moisture-proof bags. Recharging extinguishers requires merely mixing powders with cold water.



Plastic bags contain two-powder charges for foam extinguishers

Foam charges can be furnished for all sizes of soda-acid and foam extinguishers and chemical engines, including the 40-gal engines.

(Foam Charges are a product of the National Foam System, Inc., Dept. CP, West Chester, Pa. Check CP 5762 on handy form opposite last page.)

### Sets dates for courses in industrial safety

National Safety Council's Industrial Division will offer four more sessions of its five-day course in Fundamentals of Industrial Safety. These courses serve as essential primer courses for beginners and as refresher courses for experienced safety personnel. Enrollment is limited to 32. Tuition is \$75.

Dates for courses are March 14-18, May 16-20, June 6-10, Nov. 14-18. Courses are all held at Council's Chicago headquarters.

(Information about course can be had by writing Industrial Div., National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill. . . . or check CP 5763 on handy form opposite last page.)

# SERV-RITE

## Insulated Thermocouple Wire Extension Lead Wire

FOR

PLATINUM COUPLES  
CHROMEL ALUMEL  
IRON CONSTANTAN  
COPPER CONSTANTAN  
IRON CUPRONEL

No matter what your wire or insulation requirements may be, you can depend on Gordon "Serv-Rite" insulated wire for pyrometers—recognized as a standard of highest quality for nearly half a century. All "Serv-Rite" wire is now manufactured in the new, completely modern Gordon plant, employing up-to-date equipment and machinery, supervised and operated by skilled technicians—your guarantee of continued precision quality. In addition to maintaining large stocks of all common types of wire, Gordon will manufacture special insulation, in long or short runs, to suit your individual needs and meet your most rigid specifications.

### All Types of Insulation

Felted Asbestos  
Asbestos Braid  
Weatherproof Braid  
Glass Braid  
Polyvinyl Plastic  
Nylon Braid  
Stainless Steel Armored Braid  
Silicone Treated  
Cotton Braid  
Lead Jacket

Ask for Bulletin No. 1200 for Application Data and Complete Specifications on Thermocouple and Extension Wire

**GORDON SERVICE**

**CLAUDE S. GORDON CO.**

Manufacturers & Distributors

Thermocouple Supplies • Industrial Furnaces & Ovens  
Pyrometers & Controls • Metallurgical Testing Machines  
603 West 30th Street, Chicago 16, Illinois  
2031 Hamilton Avenue, Cleveland 14, Ohio

When inquiring check CP 5764 opposite last page

CHEMICAL PROCESSING

## SAFETY

### Makes painting safer

Paint pot hooks on to rung of step ladders. On scaffolds or staging it is hung on side rails.

Adjustable ramp acts as dip-gage for putting right amount of paint on roller.



Facilitates heavy-duty painting

Container holds gallon of paint and up. Models are available for roller 9, 14 and 18" in width.

(Rol-A-Pot is a product of the American Products Co., Dept. CP, 3308 Edson Ave., New York 69, N.Y. . . . or for more information check CP 5765 on handy form opposite last page.)

### No danger of sparks with aluminum hammer

High strength aluminum alloy soft-faced hammers are non-sparking and anti-magnetic. Cast in one piece, they have knurled handles and are difficult to snap or break.

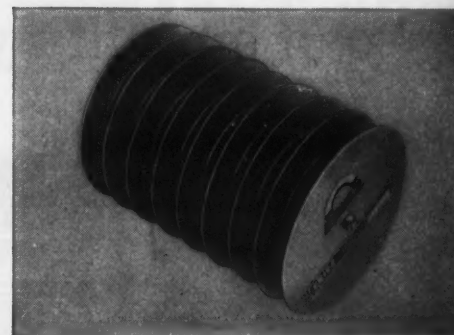
Sizes range from handles length of 9-1/8" to 12", diameter of face range from 1 1/2 to 2 1/2".

(Non-sparking hammers are product of Savoy Products Co., Dept. CP, 41 Oviatt St., Hudson, Ohio . . . or for more information check CP 5766 on handy form opposite last page.)

For more information on product at right, specify CP 5767 . . . see information request blank opposite last page. ➡



**EYE-POPPING POWER.** Get close to a powerful Eriez Magnet and it will pull industrial goggles right off your nose, as Art Baker, popular TV personality demonstrates. The idea of a really powerful magnet has found a profitable application in American industry: separating tramp iron from processing lines . . . tramp iron which causes fires, machinery damage and product contamination. *All Eriez Magnets are non-electric, self-contained. They operate without any wires or attachments. Best of all their magnetic power lasts a lifetime.* The first cost is the last.



**FURROWING THROUGH TRAMP IRON DANGER.** The solution to removing tramp iron from free-flowing material in slope-shaped hoppers was found in a magnet which looks like a farm furrow. The Eriez Hopper Magnet consists of steel step-discs spaced in 1" increments. Built in any width desired, this hopper magnet efficiently removes tramp iron which causes machinery damage, fires, and product contamination. Ideal for surge-fed application. Want more information on this product? . . . request Bulletin B-204.

## MAGNETIC IDEAS FROM

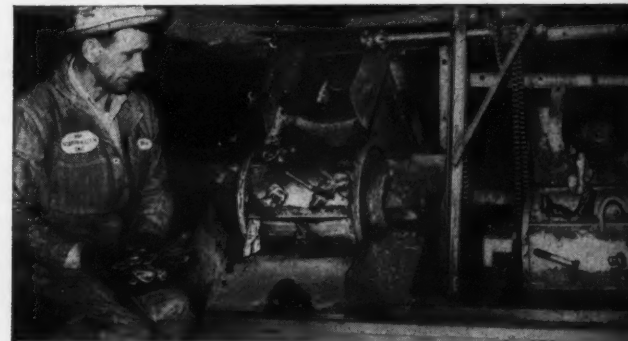
# ERIEZ



*Eriez "Magnetic Ideas" can help you. Eriez' factory-trained field men, backed by Eriez' laboratory and engineering know-how, will be happy to study your particular problem, make a plant survey and offer helpful "Magnetic Ideas". Write or call Eriez Manufacturing Company, 73Q Magnet Drive, Erie, Pa.*



**PAPER MILL PROTECTS PUMPS.** Two bucketfuls of tramp iron are removed every month by an Eriez Magnetic Pressure Hump in one of the East's largest plants making book and magazine grades of paper. This installation, in the line at the point following the beaters and ahead of the Jordans, has proved to be the solution to pumps damaged by bailing wire, nails, and other forms of tramp iron found in the white water lines. Heretofore, pumps had to be serviced 4 or 5 times a week. It will pay you to get more information about this magnetic separator and the dozens of others that Eriez offers. Request new 16-page Catalog 17.



**ROLLING DRUMS HALT METAL PARADE.** Tramp iron stops when it reaches these Eriez Magnetic Drums installed at the Stappenbeck Rendering Co., Rochester, N. Y. Manufacturers of tallow, processed meat scraps, etc., the company uses the magnetic drums to remove all traces of metal from the finished product, and to prevent damage to costly screens and expellers. Previously, *because of metal damage*, screens had to be changed after 1 to 5 tons of material had passed over them. Now they're changed after screening 40 or 50 tons, and then only because they wear out, *not because of tramp iron damage*.

# New multi-purpose 10 lb. Ansul Extinguisher can simplify your fire protection problem



Lightweight, easy-to-operate Ansul 10-pounder gives fast, effective results even when used by women employees.



The 10-pounder stands up under rugged road use. Built to give dependable service after extreme exposure. Listed by Underwriters' Laboratories.

New rugged unit gives you high fire killing rating, light weight, modern design

The new Ansul 10-pounder is *designed and constructed* for all-around plant use—wherever dry chemical protection of this capacity is called for. It is ideally suited for truck protection, other outdoor hazards and indoor use. This multi-purpose advantage means that you have fewer models of extinguishers to service and a less complicated training program to maintain.

The high fire killing rating (B1, C1) of this unit gives you *effective protection the instant* it's needed. Another advantage of the Ansul 10-pounder is its light weight. This feature is important where women are called upon to lift and operate the unit. This extinguisher is also modern in appearance. It was styled by Raymond Loewy to be *seen* in any location—in the office, laboratory, plant, or on a truck.

Have the Ansul Man review your class B and C hazards, those involving flammable liquids, gases, and electricity. He will show you how the Ansul 10-pounder can make your fire protection program easier to administer, more economical to maintain.

## Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-125, Marinette, Wisconsin. Write Ansul for your copy of new Fire Equipment Catalog.



## SAFETY

**Density of smoke in stack effluent determined accurately, quickly with optical instrument . . .**

eliminates errors from background light near smoke and ambient light near observer

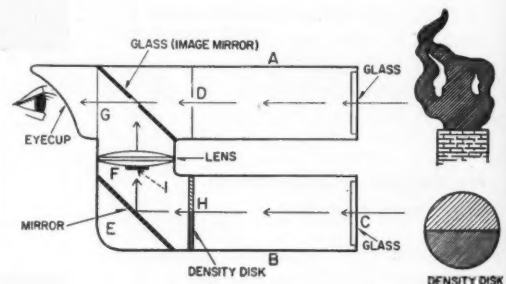


Official checks smoke density without charts

**Uses:** To determine whether or not fuel is being properly burned to gain full Btu advantage and to indicate when smoke density exceeds municipal smoke ordinances.

**Features:** In using Smokescope, reference standard film disc is viewed against background adjacent to stack; film receives light from same source as smoke. Ambient light plays no part in observation.

**Description:** In making smoke density estimation, observer views stack through instrument, aiming it so that smoke fills field of vision through apertures C, D, and G. These prevent entrance of stray light. Light from area adjacent to stack is



transmitted through reference disc, H, in barrel, B, to surface of mirror, E. From mirror, an image of reference disc is projected through lens F onto image mirror where it is compared with smoke seen through apertures. Center portion of reference disc image is blocked by opaque disc, I.

(Smokescope is a product of Mine Safety Appliances Co., Dept. CP, 201 N. Braddock Ave., Pittsburgh 8, Pa. Check CP 5769 opposite last page.)

## Have a safety problem . . . ?

the handy Product Directory (pages 201 to 204 in this issue) is your guide to equipment and ideas which may suit your needs.

When inquiring check CP 5768 opposite last page

USE T  
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Flooring

Cutter Cov

Partitio

CRIP-S

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BENJA



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MARC

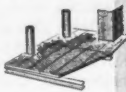
## USE THIS NEW SAFETY MATERIAL

ALL OVER  
YOUR  
PLANT

Work platforms



Flooring



Gutter Covers



Partitions



**Safety**  
**GRIP-STRUT**  
**NON-SKID—RUGGED—LOW COST**

Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber and stocked in your storeroom like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it—it's inexpensive, yet permanent and safe.

Write today for new catalog showing loadings and methods of easy application in your plant.

Distributors in all principal cities.

**GRIP-STRUT division**  
**THE GLOBE COMPANY**  
Manufacturers since 1914

4006 S. Princeton Ave. • Chicago 9, Ill.

When inquiring check CP 5770 opposite last page

Obtain Better Lighting for the Seeing Task

in **EXPLOSIVE ATMOSPHERES**  
with **BENJAMIN**  
**EXPLOSION**  
**PROOF**  
lighting units

If safety regulations, fire insurance or building code call for UL approved Explosion-Proof lighting, you need not sacrifice proper lighting in order to meet these requirements. You need not handicap workers with poor light which does not fit their particular seeing task. You need not stand for production slow-down in such locations due to improper illumination. The wide variety of reflectors available with Benjamin Explosion-Proof units makes it possible to provide the correct light for every seeing task found in industrial explosive atmospheres. For utmost protection against depreciation and deterioration, each reflector is covered with "Life-Time" Porcelain Enamel fused to steel... the unsurpassed reflecting surface which resists the corroding effects of fumes, moisture and grime and is easily cleaned with soap and water. **Free Bulletin EP** contains complete Explosion-Proof lighting facts.

**BENJAMIN ELECTRIC MFG. CO., Dept. LL, Des Plaines, Illinois 336**



When inquiring check CP 5771 opposite last page

MARCH, 1955

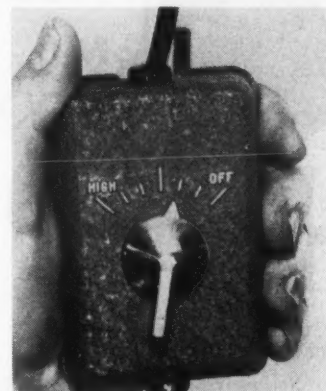
## SAFETY

**Rheostat safe for use in hazardous areas**

**Uses:** For step control of low-current applications.

**Features:** Integral switch turns unit off automatically when pointer dial is turned to "off".

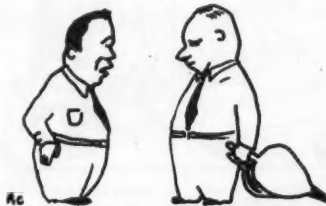
**Description:** Totally-enclosed dial rheostat has dial which allows



Rheostat for low currents has dial for selection of 40 different resistances

selection of 40 different resistances. It measures 3-15/16" long and 2-9/16" wide. Case is of die-cast aluminum. Rheostat is rated at 9 amp, 115 volts AC-DC, 75 to 300 ohms.

(Model D-40 Rheostat is a product of Colbert Die Cast Co., Manufacturing Div., Dept. CP, 5416 Tweedy Blvd., South Gate, Calif. . . . or for more information check CP 5772 on handy form opposite last page.)



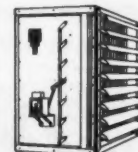
"That's not what I mean by an explosion-proof blower!"

Is this the way your plant gets its **MAKE-UP AIR**?

IF SO,  
YOU NEED

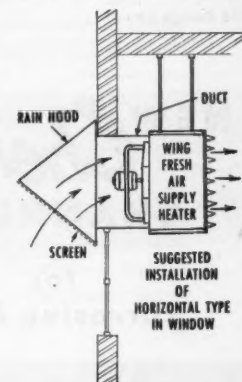
## WING FRESH AIR SUPPLY HEATERS

WHEN air is exhausted from paint spray booths or other plant operations, it must be replaced. If no other means are employed, it rushes back through opened doors or windows, or seeps back through cracks and crevices. Your exhaust fans can't work properly or efficiently and your heating system is nullified. WING FRESH AIR SUPPLY HEATERS are the answer. They supply make-up air properly heated, they require no expensive duct work and the coils cannot freeze, regardless of weather, because full steam pressure is on at all times.



HORIZONTAL TYPE  
WING FRESH AIR  
SUPPLY HEATER

Write for  
complete  
information



**L. J. Wing Mfg. Co.**

179 Vreeland Mills Road  
Linden, New Jersey

Factories at Linden, N.J. & Montreal, Can.  
In Europe: Wanson, Brussels, Belgium



SEVENTY-FIVE YEARS AGO  
Demonstrating the new Edison phonograph. This simple hand-cranked machine, invented in 1877, was soon to be in every home, doing for sound what the invention of printing had done for literature. In 1879, L. J. Wing, another talented inventor of that period, was designing and building fans, steam engines and electric motors, which won many awards for the L. J. Wing Mfg. Co., today celebrating its 75th anniversary.

When inquiring check CP 5773 opposite last page



In addition to having the motor out of the airstream, fresh clean air is constantly drawn through the motor hood creating an air curtain around the motor shaft which absolutely prevents fumes from entering the housing while the unit is in operation.\* This eliminates most special winding motors.

Where high slot speeds must be maintained Gallaher Air-Vans with patented scroll effect design are generally the answer. Design research has shown that without this feature efficiency against even  $\frac{1}{4}$ " S.P. is impossible. Gallaher units develop up to 4" static pressure and 65,000 CFM. Ratings have been certified in an independent laboratory under the direction of a nationally recognized authority.

Other features include low silhouette, weatherproof design, low noise levels, and availability in special metal and finishes, shipped as a complete package ready for installation. \*patented exclusive features.

## The GALLAHER Company

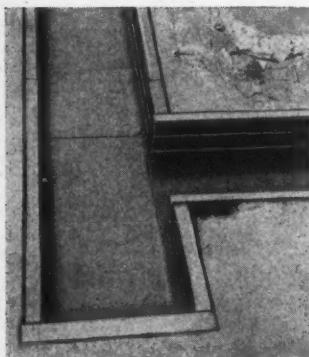
4108 Dodge Street

Omaha 3, Nebraska

When inquiring check CP 5774 opposite last page

## NEW Chemi-Drain CHANNEL PIPE

for  
corrosive liquids



Logan's new Chemi-Drain Channel Pipe is designed specifically for floor drainage of corrosives. It's made of corrosion-proof, never-wear-out Vitriified Clay. Chemi-Drain gutters can be installed in any concrete floor for continuous drainage or fast wash-downs to protect personnel and equipment from acids, alkalis, and dangerous liquids of any kind. Covered with a grill or floor plate, the drain is flush with the floor and easy to open for cleaning. For full details, write: The Logan Clay Products Co., Box 698L, Logan, Ohio.

DISTRIBUTOR INQUIRIES INVITED

first  
TO GUARANTEE

# LOGAN

ESTABLISHED 1890

THE LOGAN CLAY PRODUCTS COMPANY, BOX 698L, TEL. 5-2184, LOGAN, OHIO

When inquiring check CP 5775 opposite last page

## SAFETY

Insulates worker's feet  
against heat and cold  
with foamed vinyl

Safety shoe has been developed  
for refrigeration departments, ice  
plants, hot mills and other spots



Protects feet against heat, cold

where feet are exposed to extremes of heat and cold.

Insulation is provided by layer of foamed vinyl which will not absorb moisture, perspiration, or oil.

They are available in 8" high field boots and 12" rubber winter-pac.

(Thermaliner Safety Shoe is a product of the Lehigh Safety Shoe Co., Dept. CP, Emmaus, Pa. . . . or check CP 5776 opp. last page.)



Cartoon above is reproduction of National Safety Council poster 0294-B. For information on safety posters write National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill.



## Drive out FOUL AIR Blow in FRESH AIR with Coppus Type A Ventilator

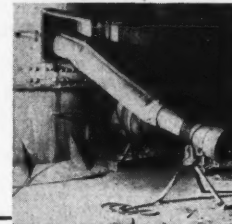
Assure greater safety, comfort for workers... get greater efficiency.

Drive out dangerous fumes, gases, stagnant or hot air from boilers, cable manholes, tanks, vats and other confined places. Supply fresh air continuously.

Send now for further information. Coppus Engineering Corporation, 383 Park Avenue, Worcester 2, Mass.

MANHOLES made safe for workers' entrance within minutes.

BOILER AND TANK INTERIORS cooled by Coppus. Fresh air supplied continuously.



When inquiring check CP 5777 opposite last page



## REACH HIGH PLACES SAFELY

A Ballymore Safety Step Ladder provides safe, sure footing in high places wherever you need it, prevents accidents and fear of accident.

Readily portable on ball bearing casters, but can't roll or kick out when supporting a person... weight automatically retracts casters, gives firm 4-point grip by rubber-tipped legs.

All steel construction. Three to eight steps with, one to three steps without, hand rails.

WRITE TODAY FOR COMPLETE CATALOG

# BALLYMORE COMPANY

WAYNE 10, PA.

When inquiring check CP 5778 opposite last page

CHEMICAL PROCESSING

## SAFETY

### Value of wearing safety clothes is proved on two occasions at Metal Hydrides, Inc.

Each employe in the Chemical Division of Metal Hydrides, Inc. Beverly, Mass. is furnished two pairs of special coveralls. No one is permitted to work without them. They were adopted to protect against flash fires in solvents or reactive material in process, if these dangers ever occurred.

Despite elaborate and thorough safety precautions, two incidents point out the wisdom of requiring such safety clothing. On one occasion, chemical operator was loading dryer with solution when special foil drying tray split, spilling material on operator's arm and thence to floor.



Operator wearing safety coveralls

Residual moisture on floor ignited spill and also the syrup on operator's sleeve. Fire was quickly extinguished without damage — except to coverall. Portion of garment, sleeve and adjacent area on which chemical had burned, fused and broke away from undamaged part as operator removed coveralls. Street shirt

underneath was untouched.

In another incident, minor flash in product receiver scorched part of employe's garment but failed to penetrate material.

Ability of the garment to withstand combustion and chemical attack is due to the Dynel (product of Union Carbide and Carbon Corp.) used in its construction.

(Garments described are ChemKlos, a product of Mine Safety Appliances Co., Dept. CP, Braddock, Thomas & Meade St., Pittsburgh 8, Pa. Check CP 5779 on handy form opposite last page.)

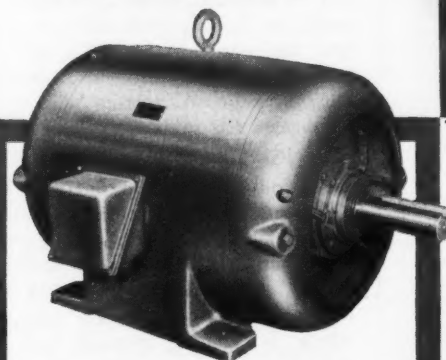
### Protective equipment and devices described in booklet

Illustrated 130-page catalog covers respiratory devices, eye protection, hats, gloves, carboy pumps, drum pumps and other safety equipment. Unusual safety specialties for use in industries, mines, utilities, etc. are also described.

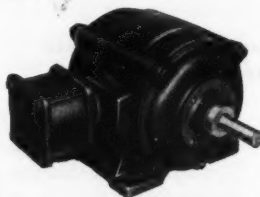
"Everything in Safety" is issued by General Scientific Equipment Co., Dept. CP, 2700 W. Huntingdon St., Philadelphia 32, Pa. When inquiring specify CP 5780 on handy form opposite last page.

**Wagner**  
ELECTRIC MOTORS  
... the choice of leaders  
in industry

## use WAGNER Cast Iron Frame Motors for EXTRA PROTECTION in corrosive atmospheres

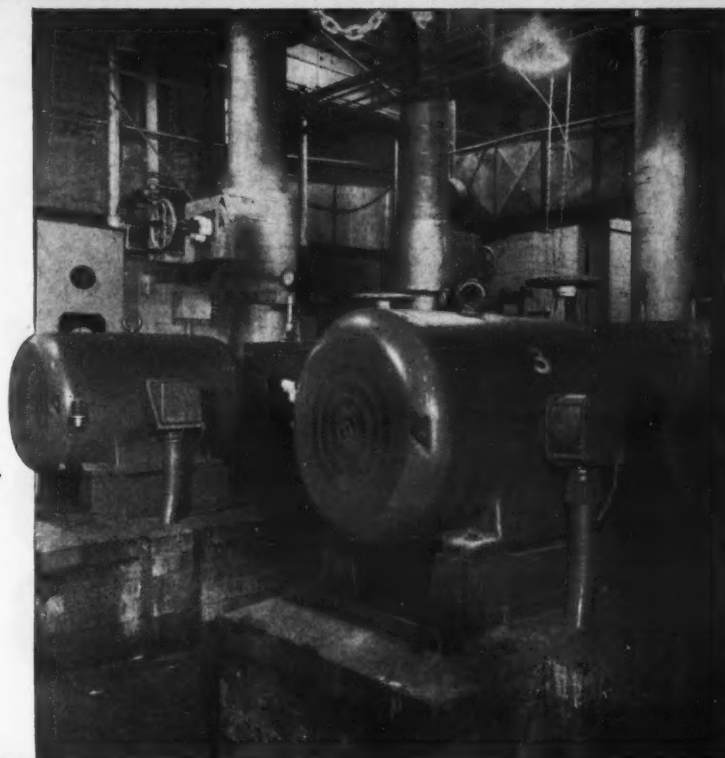


Type EP, totally-enclosed fan-cooled. Available in ratings from 2 to 250 hp.



Type JP, non-ventilated. Explosion-proof. ½ through 1½ hp.

**Wagner**  
Electric Corporation  
EST. 1891



These 150 hp Wagner Cast Iron Frame Motors drive brine pumps in an acid area at Celanese Corporation's Rock Hill, S. C. plant.

If the motors in your plant are subjected to corrosive fumes and liquids, Wagner Cast Iron Frame Motors will provide the *extra protection* you need.

These stock motors are totally-enclosed in corrosion-resistant cast iron. All parts exposed to the atmosphere are fabricated of corrosion-resistant material—even the nameplate. Features include completely protected laminations... special varnish treated windings... a running shaft seal.

Wagner Cast Iron Frame Motors are available in fan-cooled standard and explosion-proof types in ratings from 2 to 250 hp, and in non-ventilated standard and explosion-proof types in ratings from ½ through 1½ hp. Wagner Bulletin MU-132 gives complete information.

A skilled Wagner engineer will help you select the Wagner Motor to meet your most exacting specifications. Call the nearest of our 32 branch offices, or write us.

WAGNER ELECTRIC CORPORATION  
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS  
TRANSFORMERS  
INDUSTRIAL BRAKES  
AUTOMOTIVE  
BRAKE SYSTEMS—  
AIR AND HYDRAULIC

When inquiring check CP 5781 opposite last page

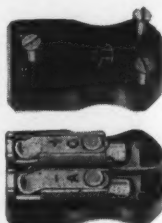
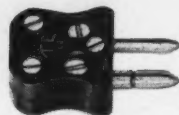


## WHY USE QUICK- COUPLING CONNECTORS FOR THERMOCOUPLE CIRCUITS?

**TO SAVE TIME!**

Frequent making and breaking of thermocouple circuits can take a lot of costly time. However, if you use T-E plug-and-jack connectors, a circuit can be made as quickly and easily as plugging in a radio.

Electrical contact is established through polarized elements which are made of thermocouple materials (your choice for use with Iron Constantan, Copper Constantan or Chromel Alumel Thermocouples). To maintain good electrical connection, the mated plug and jack provide both long-wiping surfaces and spring-loaded contacts. The connectors have screw-fastened, insulated covers, colored and marked to indicate calibrations.



PAT. PEND.

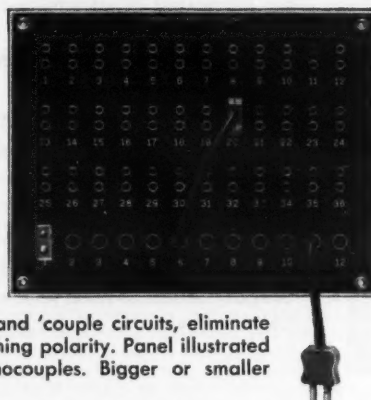
Interested? Write for Bulletin 23-R.



## WHY USE CONNECTOR PANELS FOR MULTIPLE THERMOCOUPLE CIRCUITS?

**TO SAVE TIME!**

By connecting all thermocouple circuits through central points, such as T-E's connector panels, you can save time in 2 ways. (1) Check instruments or thermocouple circuits from one or more centrally located distribution panels. With plug-and-jack connectors, test instrument is easily and quickly tapped into any circuit. (2) Transfer multiple thermocouple circuits. The panel's quick-coupling connectors permit rapid making and breaking of instrument and 'couple circuits, eliminate splicing time and avoid mis-matching polarity. Panel illustrated takes 12 pyrometers, 36 thermocouples. Bigger or smaller panels, if you want 'em.



Interested? Write for Bulletin 23-R.

Pyrometers • Thermocouples • Protection Tubes • Quick-Coupling Connectors  
Thermocouple and Extension Wires • Resistance Bulbs • Connector Panels

# Thermo Electric Co., Inc.

SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY  
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 5782 opposite last page

## SAFETY

### Prevent shocks, arcing with circuit-breaking electric plugs

**Uses:** For prevention of electric shocks and arcing caused by ungrounded plugs and various receptacles.

**Features:** Insulation has high-arc resistance and low-moisture absorption. Cable entrance is held watertight by rubber cable bushing clamped by combination gland unit and strain relief clamp. Exposed non-current carrying metal parts of electrical equipment may be grounded to plug sleeve.

**Description:** With screw-driver, one-piece interior assemblies can be interchanged. Plugs and receptacles feature pressure connector wiring and take any type and size portable cable up to 30 amp at 600v AC or 250v DC. Pressure connectors eliminate need for soldering.

(Series M54 plugs and receptacles are products of Crouse-Hinds Co., Dept. CP, Wolf & 7th North Sts., Syracuse, N.Y. . . . or for more information reader may simply check CP 5783 on the convenient Reader Service slip which is located opposite last page.)

### Safety clothing rinse described in bulletin

Information sheet describes an emulsion that is rinsed into Dynel industrial clothing during routine laundering to make the garments splash-resistant to acids and alkalis. Although Dynel itself is resistant to these chemicals, use of the rinse assures that splashed chemicals will not penetrate to undergarments or skin. Porosity of the fabric is unaffected by the rinse.

"Neiradex No. 1" is issued by Neirad Industries, Inc., Dept. CP, One Post Rd., Box 865, Darien, Conn. When inquiring reader may simply specify CP 5784 opposite last page.

# NEW! NEW! NEW!

### Up-to-date facts on new Tri-Forged welded and Tri-Lok interlocked grating and stair treads



Here's vital information for ready reference on the new Tri-Forged steel grating and stair treads, plus latest information on Tri-Lok interlocked products. This fact-filled catalog gives you installation specifications, types of grating and stair treads available, and safe load tables. Be sure to write for your copy today.

For your free copy  
write department D-2703



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CORPORATION  
Pittsburgh 22, Penna.  
National Distributors

When inquiring check CP 5785 opposite last page



Measures  
8 1/2" wide x  
9 1/2" deep

Boost 100 PSI. air pressure to 10,000 PSI. fluid pressure for \$173.25 (FOB Gardena, Calif.). Eight standard models for output fluid pressures of 1,000 to 30,000 PSI. Special models for lower or higher pressures.

Applicable wherever low volume output at high pressures is the requirement. For oil or water service. Complete power packages also available. Send for bulletins.

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Engineering Corporation

1144 WEST 135TH STREET, GARDENA, CALIFORNIA

When inquiring check CP 5786 opposite last page

CHEMICAL PROCESSING

# DAVIS a complete line of GAS ANALYSIS SYSTEMS

operating by catalytic combustion, electro-conductivity, thermal conductivity, and photochemical reactions.

## Continuous ELECTRO- CONDUCTIVITY GAS ANALYZER

For the analysis of gases and vapors that ionize in water, directly or when decomposed by heat. Sensitive to small quantities.

Send for Bulletin 11-70

## Continuous COMBUSTIBLE GAS ALARM SYSTEMS

For the protection of life, property, and processes against combustible gases and vapors in air. Gives audible and visual alarm signals.

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## PHOTOCHEMICAL OXYGEN ANALYZER

Continuous measurement of oxygen in gaseous streams, 0-100 p.p.m. Outstanding for simplicity of operation, specific measurement of oxygen without interference from most other gases.

Send for Bulletin 11-40



## DAVIS INSTRUMENTS

56 Halleck St., Newark 4, N. J.

Progressive Manufacturers of  
Gas Analysis Instruments

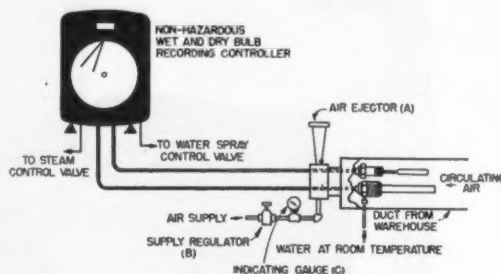
When inquiring check CP 5787  
opposite last page

## SAFETY

### Explosion-proof equipment unnecessary for wet and dry bulb measurements in hazardous area . . .

wet bulb blower replaced by air ejector operating on plant's compressor

Method has been developed for controlling and/or recording humidity of explosive or dust-bearing atmospheres in warehouses, grain mills, etc., without use of explosion-proof equipment.



This method employs a wet and dry bulb recorder-controller which uses a mechanical chart drive rather than a pneumatic or electrical drive. The recorder-controller is connected to a porous sleeve installed in a small enclosure.

Supply of compressed air is fed through a regulator (B) and indicating gage (C) to air ejector (A). Partial vacuum created by ejector draws sample air into enclosure and past wet bulb.

The ejector (Penberthy Series 20 XL-96 or equivalent) can be easily enclosed in a section of standard stove pipe, air duct or any housing that assures constant flow of air past wet bulb.

Nonhazardous control of humidity under explosive conditions using wet and dry bulb recorder-controller can be used for material and product conditioning, elimination of static electricity, air conditioning and other purposes.

(Recorder-Controller is a product of Foxboro Co., Dept. CP, 86 Neponset Road, Foxboro, Mass. Check CP 5788 on handy form opposite last page.)

### Suggests uses and gives details on fire-resistant chemical

Booklet gives all available information on fire-resistant material. It is intended for use in manufacture of cellulosic insulating board, building materials, paint, paper, textiles and other materials.

Borotherm Booklet is issued by American Potash & Chemical Corp., Dept. CP, 3100 E. 26th St., Los Angeles 23, Calif. When inquiring specify CP 5789 on handy form opposite last page.



...including

# DUST CONTROL

Times have changed . . . so have dust control methods. The DAY Company has played an important part in modernizing the control of dust with a new concept, a new design in dust filtering. The DAY High Pressure, Reverse Jet Dust Filter manufactured under DAY and Hersey patents is a real departure from "yesterday's" type filter.

## THE DAY "AC" FILTER PROVIDES ADVANTAGES FOUND IN NO OTHER FILTER

It saves valuable plant space because a smaller unit handles more dust laden air. Installation time is cut to a minimum because it is pre-assembled at the factory. The DAY "AC" High Pressure, Reverse Jet Filter brings to industry such advanced features as self-adjusting cleaning rings; square-to-round streamlined dust-laden air inlets; dust separation from different exhaust systems within one filter and multiple screw conveyor discharges. These and many more features give you the most efficient dust filtering at the lowest cost.

Leading companies have used DAY High Pressure, Reverse Jet Filtering for five years. 87% of DAY filter users have ordered additional DAY Reverse Jet Filters.

For facts about modern dust filtering—write to DAY for Bulletin 528R.

## The DAY Company

852 Third Ave. N.E., Minneapolis 13, Minn.  
IN CANADA: P.O. Box 70Y, Fort William, Ontario  
Branch Plants: Buffalo, Fort Worth & Toronto, Ont.  
Representatives in Principal Cities



Cutaway view of the DAY Dust Filter—available housed or unhoused—for use on either vacuum or pressure. (Licensed by H. J. Hersey, Jr.)



AIR POLLUTION with DAY DUST CONTROL

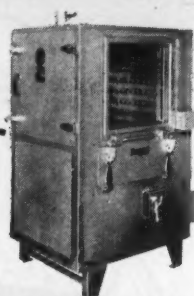
When inquiring check CP 5790 opposite last page



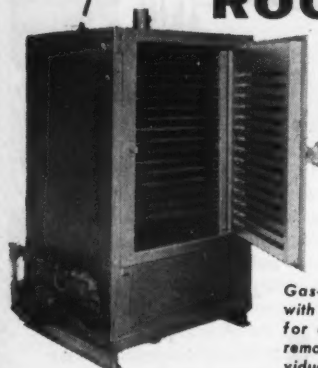
See What's  
Cooking

IN

## ROCKWELL OVENS



Cabinet type, electric recirculating oven with pyrex glass windows for inspection of work during heating and dry ice cooling.



Gas-fired oven with slotted door for convenient removal of individual trays of product.

These are but two of the Rockwell line of standard and special ovens for evaporating, drying or baking process materials to 1000°F., with close control of temperature uniformity.

Made of steel or any special metal, insulated panel construction in sizes from 18" x 18" x 18" to any desired size, either batch or continuous or conveyor oven types; electric, gas, oil or steam heated.

Write for Catalog.

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FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY

2205 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

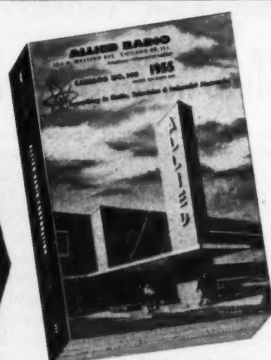
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## for the laboratory

Pharmaceutical house, Eli Lilly, has  
replaced micro-bioassay —  
now instruments find answers the  
same day



Final result is read with spectrophotometer

DR. W. B. FORTUNE  
Director of Control Division  
Eli Lilly & Company  
with BRUCE FADER, Associate Editor

## save two days in vitamin B<sub>12</sub> determination

**Problem:** Trained laboratory technicians worked for three days at a stretch determining Vitamin B<sub>12</sub> content of samples at Eli Lilly & Company. This conventional micro-bioassay method involved mixing varying amounts of B<sub>12</sub> with cultures, incubating, and making final turbidity measurement to find microorganism population. Even when three days tests were complete, results

varied rather widely. Precision of measurement was somewhere around  $\pm 20$  per cent. Time needed for such tests was the fundamental disadvantage. But in addition to slowness, this method was a nuisance because of sterilization, large amounts of glassware to be handled, ponderous computations.

**Solution:** In 1951 the laboratory began to use a new method. Not generally applicable to all similar determinations run at Lilly, this instrument analysis does work well on certain Vitamin B<sub>12</sub>-containing products.

To make these tests for Vitamin B<sub>12</sub> now, a cyanide salt is added to the solution after pH is adjusted. pH is readjusted after the addition and free hydrogen cyanide is swept from the liquid. Spectrophotometric measurement is made with a Model B or DU instrument. These are standard colorimetric determinations.

Conventional laboratory model pH meters and spectrophotometers are employed without modification. Though the analysis is fairly complicated, it has become a routine



pH is adjusted during Vitamin B<sub>12</sub> determination

to laboratory technicians on the job.

Spectrophotometer batteries and pH electrodes are replaced as needed. As a rule, no maintenance by the instrument department is required — even on a periodic checkup basis for these. Operator of the pH meter can tell when anything is wrong with it. Some problems develop due to excessive humidity, but these have been solved by using desiccants in the instrument.

**Results:** Results of determinations of Vitamin B<sub>12</sub> are available the same day that test is started. Precision of results has been improved from  $\pm 20$  per cent to  $\pm 5$  per cent. Laboratory staff of Eli Lilly is unanimous in the opinion that it would not consider going back to a bioassay method.

(Model H pH Meter and Models B and DU spectrophotometer used in this determination are products of Beckman Instruments, Inc., Dept. CP, Fullerton 1, California . . . or for more information check CP 5793 on handy form opposite last page.)

**Permits colorimetric determination of germanium by spectrometric methods**

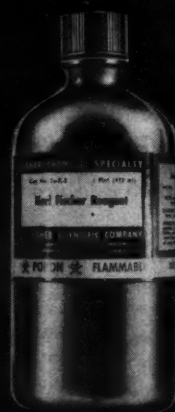
Recently-introduced reagent known as phenylfluorone (9-phenyl-2,3,7 trihydroxy-6 fluorone) makes possible spectrographic analysis for determination of germanium. Colorimetric method is extremely sensitive for germanium determination. Limit of detection of concentrated coal ashes analyzed with reagent was in order of 0.001% germanium.

(Phenylfluorone is a product of Jasonols Chemical Corp., Dept. CP, 825 42nd St., Brooklyn 10, N.Y. Check CP 5794 on handy form opposite last page.)



THE FISHER CHEMICAL MANUFACTURING DIVISION IS PROUD TO PRESENT THE FIRST COMMERCIALY AVAILABLE

# STABILIZED Karl Fischer REAGENT



This is the first commercially-available Karl Fischer reagent that can be opened and used repeatedly with practically no loss of titer. In fact, according to extensive field tests, titer is maintained at a minimum of 5.0 mg water per ml KF reagent for at least a year. The reagent measures moisture in solids and liquids, organics and inorganics, in minutes instead of hours required by oven drying. The new reagent comes in a ready-to-use single solution, no mixing necessary . . . making the Karl Fischer method more convenient to use than ever before.

Available in pint, quart and gallon lots. Catalog number is So-K-3.

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When inquiring check CP 5795 opposite last page

## NEWS from FILTERTOWN

Extremely versatile E&D #613 is equally at home in the laboratory and the industrial plant.

In the former, it is used for analysis of blood to determine sugar content, for hospital analysis tests and as indicator papers.

In the latter, it is used for filtration of such widely diversified products as fruit juices, colognes, drugs, medicinal oils, pharmaceuticals, salt solutions and bees wax.

The physical characteristics of grade #613 are: .006 inches thick, smooth surface, rapidity 60, wet strength 4.8.

We, however, are the very first to admit the likelihood that it does some jobs better than others. And by better, we think in terms of clarity of filtrate, rapidity and economy.

Thus, we continually stress the advisability of permitting our know-how to help you select the right grade of filter paper for your particular filtration process—or product.

Since E&D has sixty-five years of experience and research tucked away, and since E&D is the only company in America exclusively devoted to the manufacture of filter paper, there's a more than reasonable chance that we can be of help to you.

Write for free samples.

And ask for our Filtration Analysis Report if you have any doubts about whether you're using the right filter paper. No obligation, at all.

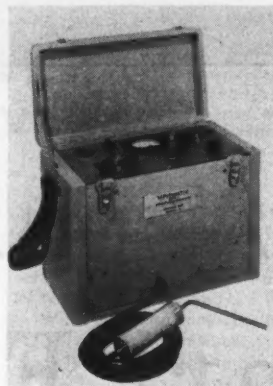
**E&D** THE  
FILTER PAPER **EATON-DIKEMAN CO.**  
FILTERTOWN  
MOUNT HOLLY SPRINGS, PA.

When inquiring check CP 5796 opposite last page

## FOR THE LABORATORY

**Detects presence of gas by absorption method of ultraviolet . . .**

analyzer is useful as system leak detector



Portable analyzer is sensitive in range of few parts per billion

**Uses:** Measures minute quantities of gas in air for air pollution studies or detecting leaks in system.

**Features:** Ultraviolet analyzer will detect less than 1/20th toxic concentration of many substances. Full scale absorbance of 0.0025 on most sensitive range permits detection of few parts per billion of such substances as naphthalene, ozone, benzaldehyde, nitrobenzene, bromine, sulfur dioxide, and benzene.

**Description:** Unit detects gas by absorption of ultraviolet light. When air being tested comes in contact with UV beam of instrument, reduction in intensity of UV beam determines concentration of gas present in air. Degree of gas concentration is registered automatically on dial of instrument. Unit is portable, making it adaptable as system leak detector.

**Description:** Unit detects gas by absorption of ultraviolet light. When air being tested comes in contact with UV beam of instrument, reduction in intensity of UV beam determines concentration of gas present in air. Degree of gas concentration is registered automatically on dial of instrument. Unit is portable, making it adaptable as system leak detector.

(Vapormaster Ultraviolet Analyzer is a product of Manufacturers Engineering & Equipment Corp., Dept. CP, Hatboro, Pa. . . or for more information reader may simply check CP 5797 on the convenient Reader Service slip which is located opposite last page.)

**Measures stress in electrodeposits by change of liquid level in capillary tube . . .**

rise or fall of metering fluid is simple linear measure of stress in deposit

**Uses:** Measures stresses in chemically-deposited metals, electroplated metals, paint, lacquer, and plastic films.

**Features:** Instrument measures stresses ranging from 100,000 psi in tension (contractile) to 50,000 psi in compression (expansive). Unit can be used in plating tank or can be used with separate tank for research in correlating atomic structure, current density, pH, and temperature, with stress.

## CHEMICAL PROCESSING EQUIPMENT FOR PILOT PLANT OR PRODUCTION

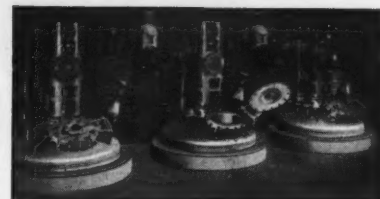


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Flexible facilities accommodate individual designs for pilot plant or production. Equipment built in a variety of sizes and finishes to your exact requirements.

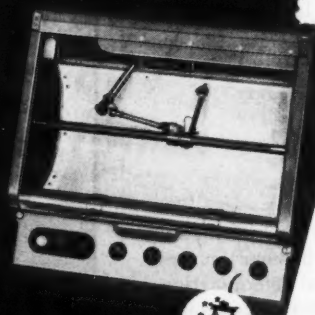
Our engineers will assist you in the selection of the most economical design for your requirements.

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When inquiring check CP 5798 opposite last page

## X-Y PLOTTER AND RECORDER



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A compact, desk-size unit designed for general purpose graphic recording from analog or digital inputs with standard Librascope converters or special modifications engineered to customer requirements. Unique pen travel, fast and dependable. Full chart visibility allowing curve generation to be observed at all times. Write for detailed catalog information.

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Computers and Controls

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A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION  
1607 FLOWER ST., GLENDALE, CALIF.

When inquiring check CP 5799 opposite last page

CHEMICAL PROCESSING

**Description:** Thin flat metal disc is clamped in place to form cover of shallow chamber filled with metering fluid. Disc is plated on its outside face in

plating solution under test. When disc is coated with material which gives contractile stress, shrinkage of plated-out material causes disc to dish in. This squeezes some of the metering fluid out of the chamber and into capillary tube. Rise of liquid in tube is measure of stress in electrodeposit. If disc is plated with material which shows expansive properties, disc bulges out and liquid level in capillary tube falls. The rise or fall of metering fluid is simple linear measure of stress in deposit.



Special model of Stresometer is available for determining stress in non-metallic films such as paint, lacquer, and plastic. In working with paint, lacquer or plastic films, film may be sprayed, brushed, dipped or rolled on disc. Stress is read from scale when film is dry.

(Stresometer is a product of Joseph B. Kushner Electroplating School, Dept. CP, 115 Broad St., Stroudsburg 1, Pa. Check CP 5800 opposite last page.)

#### **Teflon and aluminum gland achieves tight seal on lab stirrer**

**Uses:** Accommodates 1/4-inch diameter stirring rods and seals them against pressure differential.

**Features:** Gland is unbreakable, self-lubricating, usable at temps as high as 250°C, (480°F), and seals against vacuums up to 10<sup>-6</sup>mm.

**Description:** Gland is made of three parts — lower member of Teflon machined to fit 24/40 outer joints, O-ring, and threaded inner member of aluminum. Stirring rod contacts only the O-ring. Knurled portion of threaded inner member can be adjusted by finger pressure to press O-ring evenly against stirring rod. Unit is easily disassembled.

(ASCO stirring rod gland is available from Bronwill Scientific, Inc., Dept. CP, 45 Russell St., Rochester 7, N.Y. Check CP 5801 opp. last page.)



## **Celite Powders provide bulking action**

**3 to 10 times greater than any other inert mineral filler**

**POUND FOR POUND**, Celite\* diatomite powders supply more bulking action than any other inert mineral filler because their cubic volume is 3 to 10 times greater. Celite's unique "honeycombed" structure is composed of microscopic, irregularly shaped particles that won't pack down. In mass they weigh only about 10 lbs. per cubic foot.

That's why Celite is so widely used to add bulk and body to industrial formulations. For example, it extends

white pigments in paints and papers . . . it improves dispersion of insecticides and fertilizers . . . it fluffs up dry powders such as household cleansers.

Also, from Celite's "honeycombed" structure comes its great absorptive capacity. This characteristic is profitably utilized to keep powders free-flowing . . . to provide a medium for shipping or storing liquids in dry form. And because of the physical structure of its individual particles, Celite has become the outstanding

flattening agent for paints . . . it serves as a mild, non-scratching abrasive for fine polishes . . . it improves the surface appearance of plastics.

Which of the many Celite advantages can you use to build product performance or cut costs? A Johns-Manville Celite Engineer will gladly discuss your problem, without obligation. For his services or more information, write Johns-Manville, Box 60, New York 16, New York. In Canada, 199 Bay St., Toronto 1, Ontario.

\*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.



# **Johns-Manville CELITE**

**INDUSTRY'S MOST VERSATILE MINERAL FILLER**

When inquiring check CP 5802 opposite last page

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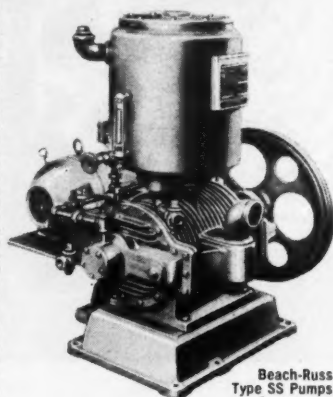
Ph-f-f-f-t

or

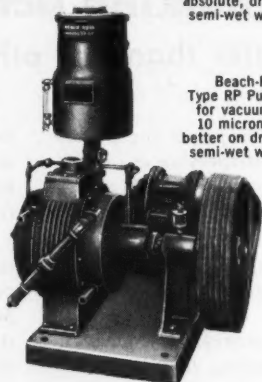
**Ph-f-f-f-t**

...you can reach and hold your working vacuum faster and at lower over-all costs with

## BEACH-RUSS ROTARY VACUUM PUMPS



Beach-Russ Type SS Pumps for vacuum up to 5 mm absolute, dry or semi-wet work.



Beach-Russ Type RP Pumps for vacuum of 10 microns or better on dry or semi-wet work.

They cost less to operate because of sturdier construction, unique design and superior mechanical efficiency. Whether you need fore-pumps to get ready for ultra-high vacuum, or where vacuum in the range from 10 microns or less and 5 mm is satisfactory, Beach-Russ Rotary Vacuum Pumps will best meet your needs.

WRITE FOR CATALOGS ON BOTH TYPES  
Address Department 46

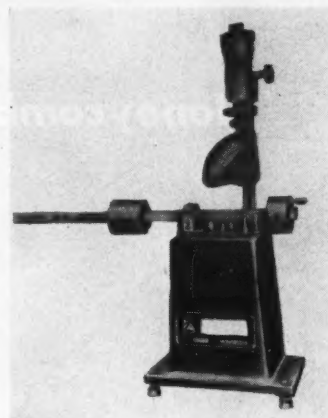
**BEACH-RUSS COMPANY**  
50 Church Street • New York 7, N. Y.

When inquiring check CP 5803 opposite last page

## LABORATORY

**Measures hardness of rubber goods in Shore units**

Durometer is designed for measuring hardness and elasticity of rubber and other pliable materials in accordance with ASTM specifications. Instrument is offered in various capacities to determine



Durometer reads in Shore units

full range of hardness values in Shore units. Standard model reads up to 100 Shore units. Other models are available with one-third full scale.

Calibrator for use with durometer is graduated directly in Shore units making gram-weight conversions unnecessary. Instrument may be used for calibrating durometers of all standard makes.

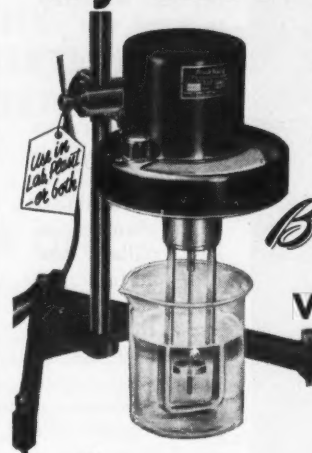
(Mod Z-123 Durometer and Mod Z-224 Calibrator are available from William J. Hacker & Co., Inc. Dept. CP, 82 Beaver St., New York 5, N.Y. Check CP 5804 opposite last page.)

**Gives theory, operation of single-pan balances**

Principle of operation and specifications on standard, semi-micro, and micro single-pan balances are given in eight-page bulletin.

Bul FS-207 is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. Specify CP 5805 opp. last page.

**Like to try one?**



WITH A  
**Brookfield**  
SYNCHRO-ELECTRIC  
**VISCOMETER**

... you make determinations directly in centipoises — as quickly and easily as taking temperature readings. Brookfield Viscometers are the standard the world over for accurate work with both Newtonian and non-Newtonian materials. Effective range: 1 to 32,000,000 CPS.

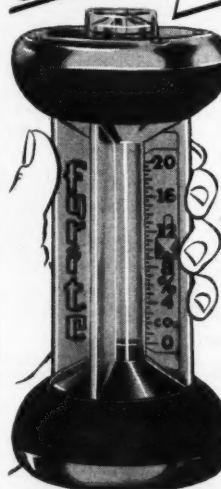
See for yourself, at no risk of any kind, how a Brookfield Viscometer can save you time, trouble, dollars. Don't delay. Write Dept. B.

**BROOKFIELD ENGINEERING LABORATORIES, INC.**

260 CUSHING STREET, STOUGHTON, MASS.

When inquiring check CP 5806 opposite last page

**CONVENIENT LOW COST ACCURATE**



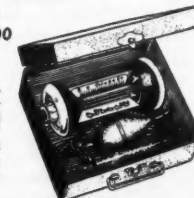
## OXYGEN and CO<sub>2</sub> Analysis

FYRITE Gas Analyzer shown at the left is available in two models—one for direct CO<sub>2</sub> analysis, the other for direct oxygen analysis. Both instruments employ the volumetric method of gas analysis involving selective absorption of CO<sub>2</sub> or oxygen by a chemical absorbent. A complete analysis can be made in 40 seconds. Accuracy is within one-half of one per cent CO<sub>2</sub> or oxygen. Absorbing fluids are furnished in individually bottled refills, and replacement of the fluid in the instrument merely requires removing the four screws that hold the cap assembly in place.

Write for Leaflet I-700

Available Individually or As A Set

FYRITE Gas Analyzers can be supplied individually—in a metal instrument chest complete with rubber aspirator, rubber and metal sampling tubing and filter, as shown at the right; or in a "Duplex Kit" which comprises both CO<sub>2</sub> and Oxygen Analyzers together with one complete gas sampling assembly for connecting either instrument to the desired sampling point.



**BACHARACH Industrial Instrument Company**  
7301 Penn Avenue • Pittsburgh 8, Pa.

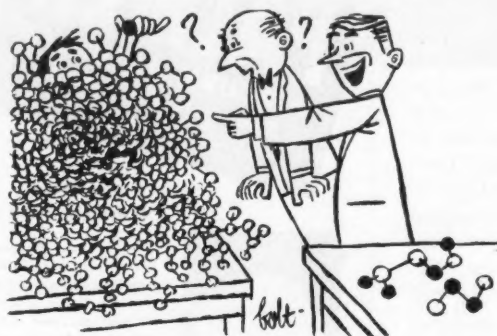
When inquiring check CP 5807 opposite last page

CHEMICAL PROCESSING

**Permits building of molecules  
to accurate scale  
for research**

**Uses:** For accurate study of many aspects of geometrical and optical isomerism, tautomerism, resonance, three-dimensional arrangements of macromolecules, biochemical specificity, and various types of steric effects.

**Features:** Scaled atoms are based upon recent experimental data applying to covalently-bonded atoms. Shapes and sizes of atomic units represent spheres of action of single atoms at magnification



"... And Jones, here, is working on high polymers."

of  $1.5 \times 10^8$ . One centimeter between any two points on molecule constructed from models is approximately equal to 0.66Å, measured between corresponding points on actual molecule.

**Description:** Connections between atoms are made with quick fasteners. When making connections, fastener is inserted in one model and next one snapped onto it. Models with only single bond are provided with permanent quick fastener. Rigid connections for multiple bonds are obtained by use of small, removable, spring metal wedges.

(Atom models are products of Arthur S. LaPine & Co., Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. . . . check CP 5808 opposite last page.)

✦ ✦ ✦

**"THAT'S INTERESTING"**

**Trees as a crop**

Trees have already become an important crop for the farmers of the Southeast. Average yearly volume of cellulose made from trees has been equivalent to 24,000,000 bales of cotton. More attention was recently focused on this crop by the opening of Rayonier's chemical cellulose plant in Jesup, Ga. This plant will require some 1,750,000 trees per year for the production of chemical cellulose. The material finds use in synthetic fibers, plastics, cellophane, tire cord, and many other products.

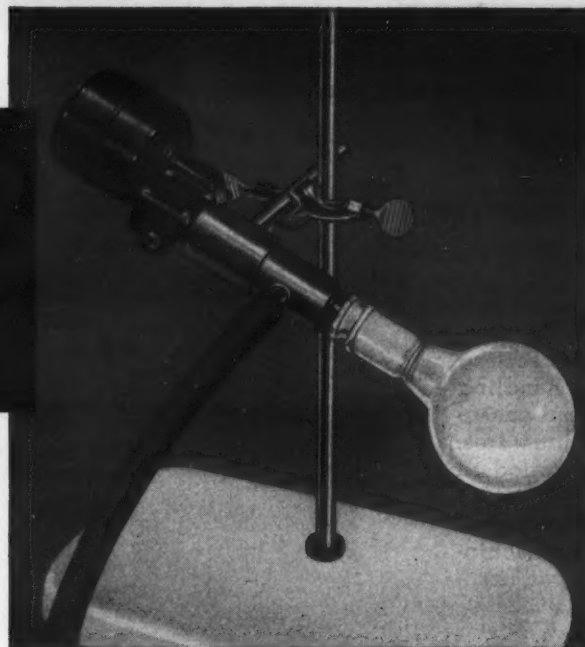
**for rapid  
evaporation  
of solvents of  
low volatility**

*USE*

**THE**

**RINCO ROTATING VACUUM-TYPE EVAPORATOR**

(Patent Applied For)



● For speeding up routine evaporations. Handles volumes from 1 c.c. to 1000 c.c. Principle utilized—rotation of flask spreads out thin film over large area (diameter of flask) subjected to negative pressure. "Bumping" eliminated. Use of glass beads unnecessary. Rate of evaporation increased 4 to 5 times, depending on solvent used. Particularly advantageous with such solvents as water, dimethylformamide, etc. 30 ml. of water at 20° C will be evaporated in 30 minutes or less. Very useful with heat sensitive compounds and biological extracts since no temperature increases are necessary. Evaporator will, of course, operate satisfactorily at higher evaporation rates with increased temperature, when sample characteristics permit application of heat.

Evaporator consists essentially of a stainless steel shaft with a machined Standard Taper 19/38 joint at lower end. Shaft rotates on oilite bronze bearings within stainless steel housing having Standard Taper 12/30 take-off leading to vacuum pump or aspirator. Vacuum pump and trap are recommended for best results, but can be used with aspirator. Flask attached to Standard Taper joint at lower end of shaft rotates at approximately 60 r.p.m. by means of special motor. Standard Taper 19/38 joint accommodates smaller capacity flasks, i.e., 50 ml. H-63620 Reducing Adapters, Pyrex Brand Glass, permit use of larger flasks having Standard Taper 24/40, 29/42, etc. Entire apparatus can be easily disassembled for cleaning.

Can be adapted to single or multiple units.

**H-21655**—Rinco Rotating Vacuum-type evaporator complete with motor and cord for use on 115V 60C, A.C. . . . **\$96.50**

Note: Support stand, clamp and glassware are accessories and may be ordered separately.

**HARSHAW SCIENTIFIC**  
DIVISION OF THE HARSHAW CHEMICAL CO.  
CLEVELAND 6, OHIO

Cleveland 6, Ohio  
1945 East 97th St.  
Cincinnati 13, Ohio  
6265 Wiehe Road  
Detroit 28, Mich.  
9240 Hubbell Ave.



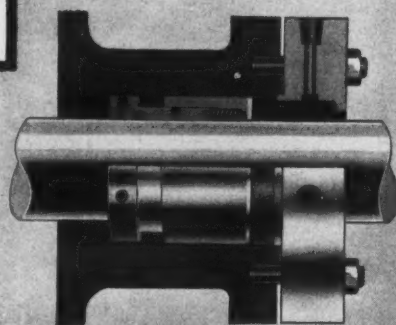
Houston 11, Texas  
6622 Supply Row  
Los Angeles 22, Calif.  
3237 S. Garfield Ave.  
Philadelphia 48, Pa.  
Jackson & Swanson Sts.

When inquiring check CP 5809 opposite last page

# DURA SEAL TYPE-P.S.

A Single Balanced  
Mechanical Seal for  
Light Hydrocarbons  
at High Pressures...

Now — perfect sealing  
for pumps handling  
light hydrocarbons up  
to 600 lb. pressures.  
Can be installed on  
your present equip-  
ment — no special  
sleeves or machin-  
ing required.



Write Today FOR DETAILS — ASK FOR BULLETIN NO. 455-CP

Send your sealing problems



to us for free counsel

DURAMETALLIC  
KALAMAZOO

CORPORATION  
MICHIGAN

When inquiring check CP 5810 opposite last page

# COLTON ROTARY PRESSES

CAPACITIES  
65 TO OVER

**5000**

TABLETS  
PER MINUTE

MIXERS—GRANULATORS—OVENS

FOR

HIGH PRODUCTION

AT

LOW COST

ARTHUR **COLTON** COMPANY

Established 1887

Div. Snyder Tool & Engineering Company  
3516 E. LAFAYETTE • DETROIT 7, MICHIGAN

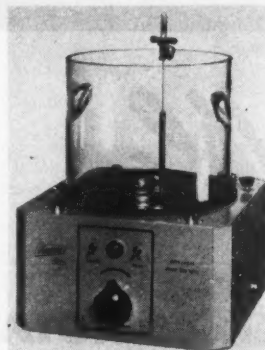
When inquiring check CP 5811 opposite last page

## FOR THE LABORATORY

Holds water bath temperature  
to within  $\pm 0.005^{\circ}\text{C}$   
of set level...

infrared heating unit with low thermal lag  
gives good heat distribution

Precision control of any temperature from 2 to  $65^{\circ}\text{C}$   
is maintained in water bath by application of in-  
frared energy. Temperature is normally held within  
 $\pm 0.005^{\circ}\text{C}$  over entire  
range. Control of  
cyclic heat input to  
bath is adjustable for  
optimum regulation.



Water is circulated in bath  
by centrifugal pump

Continuously adjust-  
able circulation is  
maintained by cen-  
trifugal pump  
mounted in base of  
unit. Connections  
are provided for ex-  
ternally circulating  
the temperature con-  
trolled water. Ex-  
ternal cooling coil  
may be connected  
to allow operation

below room temperature without depleting large  
usable volume of bath.

All controls, with exception of mercury thermo-  
regulator, are located in base of unit. Overall  
dimensions of bath are 15 x 15 x  $18\frac{3}{4}$ " high  
(when supplied with 12" diameter by 12" deep  
tank). Larger tank 18" deep may be used.

(Universal Infrared Bath Mod 12A is a product  
of Kinetic Instrument Co., Dept. 4, Dept. CP,  
3250 Skokie Valley Rd., Highland Park, Ill. . .  
or for more information about manufacturer's prod-  
uct reader may simply check CP 5812 on the con-  
venient Reader Service slip which is located opposite  
last page.)

Produces high wavelength accuracy  
and spectral purity using  
diffraction grating...

combination colorimeter-spectrophotometer  
designed for routine analyses

Uses: For making routine colorimetric analyses  
in laboratories or on production lines.

Features: Effective range is from  $375\mu$  to  $950\mu$ ;  
infrared tube and filter needed in 650-950 $\mu$  range.

Description: Operator can adjust diffraction  
grating for any wavelength over entire range by  
turning control knob. Spectronic 20 analyzes any  
liquids or solids which transmit light by exposing

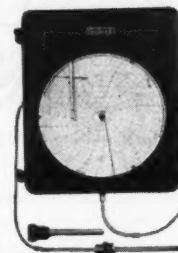
## 4 1/2" DIAL THERMOMETERS



Made in 3 types to  
suit any requirements.  
Rigid stem, wall or  
flush mounted, 11  
inches of scale read-  
ing. Interchangeable  
with standard indus-  
trial separable sock-  
ets. Stem can be  
placed at any angle  
and case can be ro-  
tated to any readable  
position.

**PALMER**  
MERCURY ACTUATED  
Temperature Indicating  
Instruments

## RECORDING THERMOMETERS



Twelve inch die-cast  
aluminum case with  
black or white wrinkle  
or satin finish. Single  
or multiple pen con-  
struction. Electric or  
spring wound clock,  
24 hour or 7 Day Re-  
volution. Flexible Ar-  
mor and bulb of stain-  
less steel. Ranges —40  
+950°F or Equivalent  
in  $^{\circ}\text{C}$ .

## INDUSTRIAL THERMOMETERS

Red-Reading Mercury  
—Extruded brass case  
— chrome finish.  
Ranges —40 +950°F  
or Equivalent in  $^{\circ}\text{C}$ .

## RED-READING MERCURY LABORATORY THERMOMETERS

Thoroughly annealed  
for permanent accu-  
racy. Complete line  
A.S.T.M. and fractional  
division types.

WRITE FOR CATALOG  
INFORMATION

**PALMER**  
THERMOMETERS, INC.  
Cincinnati 12, Ohio • ME1000-1500

When inquiring check CP 5813  
opposite last page

CHEMICAL PROCESSING

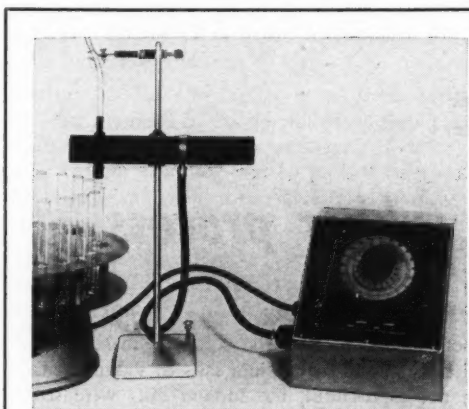


Only two control knobs are used when making colorimetric analyses

sample to light of specified wavelengths. Degree of light transmittances is registered on double scale, where readings may be taken in terms of either transmittance or optical density.

Basic components are built-in grating monochromator, photo-emissive detector and printed-circuit electronic amplifying system to build up signal.

(Spectronic 20 analyzer is a product of Bausch & Lomb Optical Co., Dept. CP, 635 St. Paul St., Rochester 2, N. Y. . . or for more information check CP 5814 on handy form opposite last page.)



Drop counter with photoelectric cell attached to timer accurately counts drops from one to 400 at each setting. Drops fall directly from glass tip into collecting tube without touching any part of counter assembly. Timer automatically indexes collector to next position after set number of drops has been delivered.

(Drop Counter is a product of Microchemical Specialties Co., Dept. CP, 1834 University Ave., Berkeley 3, Calif. . . check CP 5815, opposite last page.)

this,  
too,  
is  
**process  
control**



Oil refineries and wind tunnels have this in common: both involve a "process" containing three basic ingredients . . . first, a raw material . . . second, operations which change the raw material . . . third, a final product. And both must be controlled. Our job at CEC is to make that control as automatic as possible . . . whether the raw material is crude oil or information.

Recently we built a system (shown below) for automatic control of information at a major aircraft company in Georgia. The "raw material" is a series of electrical signals from test measurements . . . the "product," a tabulation of these measurements in immediately usable, numerical form. Here are just a few of the system's unusual features . . .

● balances and reads out up to 200 strain-gage channels at an average rate of 25 channels per minute.

● automatically tabulates true values, already corrected, in pounds, psi, degrees, etc.

● punches a master control tape so that a similar test format can be run any time . . . fully automatically.

● provides a punched paper tape for automatic conversion of all bridge outputs to IBM punched cards.

● operates with  $\pm 0.1\%$  full-scale accuracy . . . i.e., resolves d-c inputs greater than  $\pm 1$  mv into  $\pm 1000$  counts within  $\pm 1$  count.

This is but one example of how the CEC Systems Division puts advanced instrumentation to work through integrated systems engineering. For your own problem in automatic data processing . . . or in dynamic testing, chemical analysis or process monitoring and control . . . it will pay you to talk to CEC, to learn how systems engineering can go to work for you. Send today for Bulletin CEC 1304-X7.

Systems Division



## Consolidated Engineering Corporation

ELECTRONIC INSTRUMENTS FOR MEASUREMENT AND CONTROL

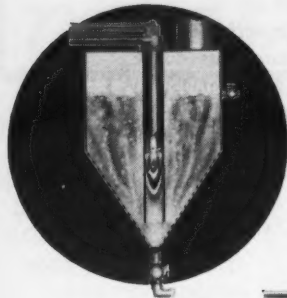
300 North Sierra Madre Villa, Pasadena 15, California

Sales and Service Offices Located in: Albuquerque, Atlanta, Buffalo, Chicago, Dallas, Detroit, New York, Pasadena, Philadelphia, Seattle, Washington, D.C.

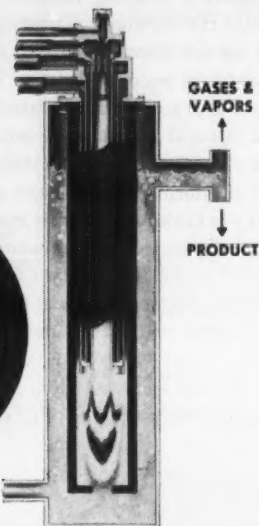
When inquiring check CP 5816 opposite last page

Schematic drawing of Subcomco® burner. Used as an evaporator.

Subcomco® burner in conical tank.



FEED →



## A PRACTICAL ANSWER to truly efficient evaporation

The Subcomco® method of evaporating corrosive solutions can eliminate costly and space-consuming tanks. The gas lift principle employed often does away with the need for a pump. All that's necessary for installation of a Subcomco® burner is a swelling in the pipe line.

The Submerged Combustion method offers special advantages in evaporating solutions with an inverted solubility curve. There is simply no heat transfer surface which can accumulate scale or which is subject to corrosion. In accordance with Dalton's laws, heat is introduced directly into the liquid without radiation losses. This is accomplished with complete safety in Subcomco® equipment because gas and air are brought separately to the flame point where mixing takes place. Subcomco® burners are the only equipment of their type having this patented NOZ-L-MIX® feature.

If you process chemicals, petroleum, food wastes, or treat metal ores, find out about Subcomco® equipment today.

APPLICATION MANUAL  
SUGGESTS PRACTICAL  
COST CUTTING METHODS

Send for Your Free Copy



## Submerged Combustion

COMPANY OF AMERICA, INC.

765 LOGAN STREET

HAMMOND, INDIANA

A Quarter-century of Service to American Industry

When inquiring check CP 5817 opposite last page

## processing equipment



High-quality water is needed to get smooth liquid latex, like that shown here being poured from frothing unit into molds

Production demands made use of distilled water  
no longer practical, so double-bed demineralizers  
take over to provide —

## pure water for foam rubber process

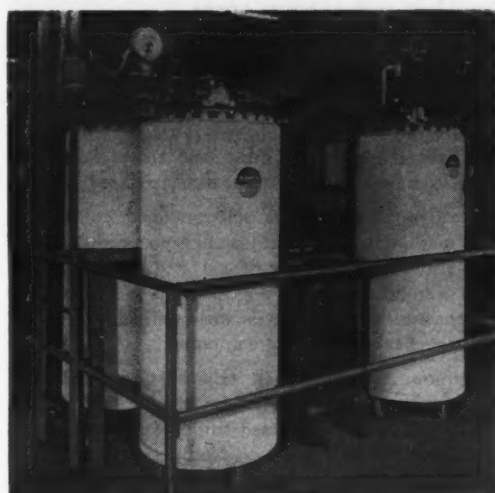
J. E. BURWELL, Manager  
Compounding and Service,  
Airfoam Development Department  
Goodyear Tire and Rubber Company  
with TED F. MEINHOLD, Assistant Editor

**Problem:** When the demand for its Airfoam rubber products began to skyrocket in 1948, Goodyear Tire and Rubber Company realized that it would no longer be practical to use distilled water in the process. Use of softened water was considered, but information available at that time indicated it

was not suitable because the softeners merely converted calcium and magnesium salts to sodium salts. While not as harmful, the sodium salts were still considered undesirable, so the idea was dropped.

With further expansion in 1950-1951, the estimated consumption of distilled water was such that the Plant C (Akron, Ohio) power house facilities just couldn't fulfill the demands. It had enough to do meeting the ordinary steam requirements. Obviously, some sort of action had to be taken.

Water is used as the base material for all compounding dispersions as well as for final dilution to con-



Double-bed demineralizers process water in foam rubber plant

trol solid content. Divalent ions cause negatively-charged rubber particles to coagulate prematurely. Not only does this affect the quality of the product, but if continued to any degree, it results in processing difficulties and excessive waste.

**Solution:** Manufacturers of water treating equipment were again contacted and, after considerable discussion, Goodyear engineers selected demineralizers as the desired units. The 28-inch diameter, double-bed units consist of a Zeo-Karb H (sulfonated coal-type, acid-resistant resin) cation exchanger and a Permutit S highly basic anion exchanger. The demineralizers are capable of producing water free of calcium and magnesium, and remove sodium salts too.

**Results:** Water obtained is of better quality than that produced by existing distillation equipment. Operating costs have been reduced and units are easier to run. Company was so pleased with results that similar units were installed in Los Angeles, California, plant.

(Demineralizers are product of The Permutit Company, Dept. CP, 330 West 42nd Street, New York 36, New York . . . or for more information check CP 5818 on handy form opposite last page.)

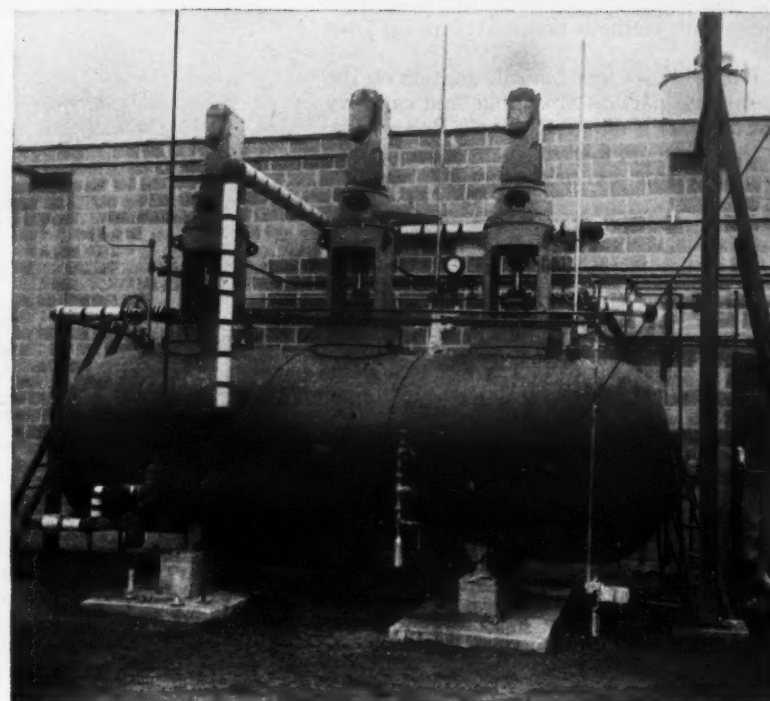
#### Water Characteristics at Goodyear Tire and Rubber Company Akron, Ohio

|                             | Raw   | Demineralized |
|-----------------------------|-------|---------------|
| Total Hardness, ppm         | 150.0 | 0.0           |
| Total Dissolved Solids, ppm | 165.0 | 3.0           |
| Silica, ppm                 | 4.6   | 0.1           |



**TURBO-MIXER**, a division of  
**GENERAL AMERICAN TRANSPORTATION CORPORATION**

## Whitaker\* chooses high pressure reduction autoclave by TURBO



1500 PSIG Test  
1000 PSIG Operating

H<sub>2</sub> Reduction  
Producing Copper Powder

For their new high pressure reduction autoclave, the Whitaker Metals Co. needed special design and engineering. This autoclave had to combine the toughest combination of services: gas absorption, solids suspension, fill and draw operation, and high pressure.

Whitaker chose Turbo. Turbo's specialists supplied the skills and experience needed to produce the job.

This same combination can serve you in special installations or in the manufacture of standard equipment such as conditioners and flotation machines, slurry mixers and general purpose units. Ask Turbo for further information on your specific problem.

\*Whitaker Metals Company, North Kansas City, Mo.



**SALES OFFICE: 380 MADISON AVENUE, NEW YORK 17, NEW YORK**

General Offices: 135 S. LaSalle St., Chicago 90, Illinois • Offices in all principal cities

**OTHER GENERAL AMERICAN EQUIPMENT:—DRYERS • DEWATERERS  
TOWERS • TANKS • PRESSURE VESSELS**

When inquiring check CP 5819 opposite last page

## what is your PULVERIZING problem?

What is your milling problem—uniformity? fineness? Do you need increased output at a lower cost? Without obligation to you, we'll grind a sample of your material in our pilot plant, using a production model Schutz-O'Neill "Superfine" Pulverizer. We'll return your processed product with our Engineering Test Report giving exact data and including recommended Schutz-O'Neill equipment, methods and mill plans for your job.

This will give you full information on the versatility, particle size range and capacity of Schutz-O'Neill "Superfine" Pulverizers. Backed by more than 60 years of continuous manufacturing and field experience.

SCHUTZ-O'NEILL PILOT PLANT uses a standard production model 16" Superfine Pulverizer. Mill components on wall at left in photo provide up to 100 different pulverizing setups, with a range from 40 mesh to 5 microns.

Below are  
two typical pul-  
verizing problems  
that were solved  
by SCHUTZ-O'NEILL

### NO. 1 PULVERIZING CERAMIC MOLDING MATERIALS

**THE PROBLEM:** To develop ceramic materials for precision molding of high temperature, high fidelity alloy castings for jet aircraft engines. Castings of molybdenum, columbium, and other rare metals were to be made. By producing precise castings, less machining is required and more rare metal saved. The particle size for best results (determined by university consultants) fell within the 60 to 200 mesh range.

**THE TESTS:** The Schutz-O'Neill pilot plant processed 200 pounds of the feed material, in a series of tests with the university ceramic consultants and the contracting firm present.

**THE SOLUTION:** Schutz-O'Neill designed a system that is now producing 1,000 to 1,200 pounds per hour of ceramic material 85 to 90 percent within the required 60 to 200 mesh range.

### NO. 2 PIGMENTS UNDER 25 MICRONS FOR COLORING PLASTICS

**THE PROBLEM:** A leading chemical firm producing a variety of resins and plastics wanted to reduce and intimately blend pigments for coloring molded plastic forms. The manufacturer found that particles larger than 25 microns produced streaks in the finished molding. In addition, tints prepared from more than one color necessitated absolute dispersion and optimum blending to insure proper shading and depth.

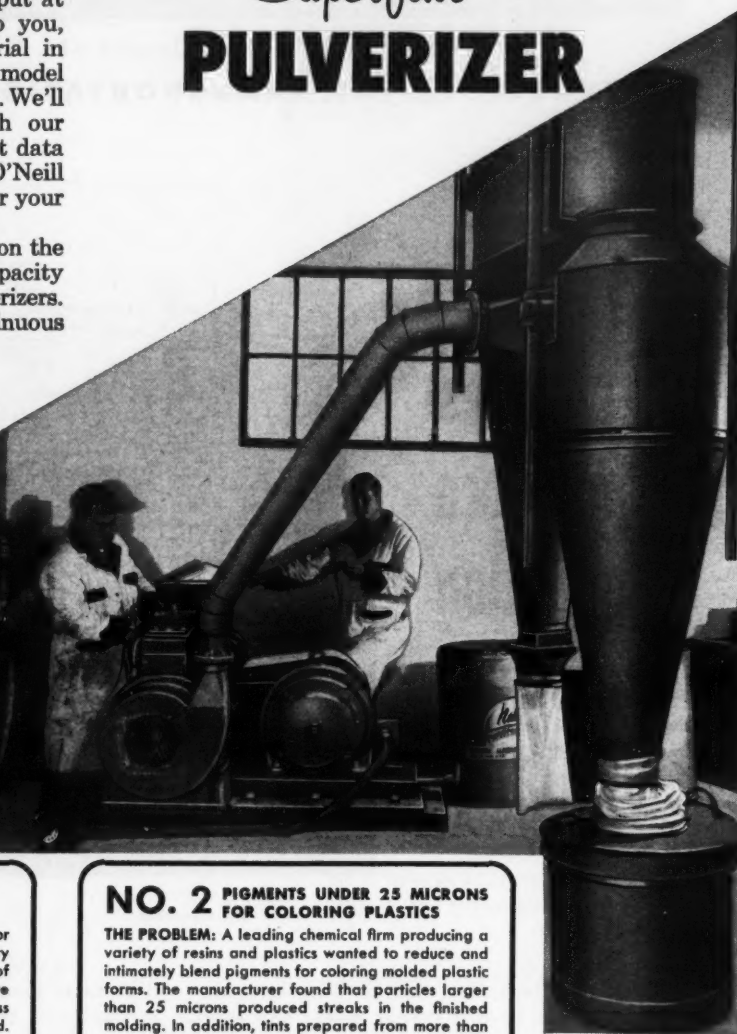
**THE TESTS:** Pilot plant test runs were conducted at Schutz-O'Neill. The resulting product was analyzed in the manufacturer's lab. In their report to Schutz-O'Neill, the firm stated, "In all our tests your grinder was equal to or better than the others from the standpoint of fineness of grind and absence of pigment specks in our product".

**THE SOLUTION:** The chemical firm is being supplied with a 22" Schutz-O'Neill stainless steel Pulverizer.

*we'll test grind a sample for you*

with the  
**SCHUTZ-O'NEILL**

*Superfine*  
**PULVERIZER**



#### Write Us:

Tell us the stock you want to pulverize, fineness, capacity desired; we'll send shipping instructions. Or, write for literature desired on Schutz-O'Neill Pulverizers, Granulators, Roller Mills, Sifters, Cyclone Collectors, Hammer Mills.



#### PROCESSING

**Odors and fumes removed quickly  
from hot, wet exhaust gases  
by activated carbon . . .**

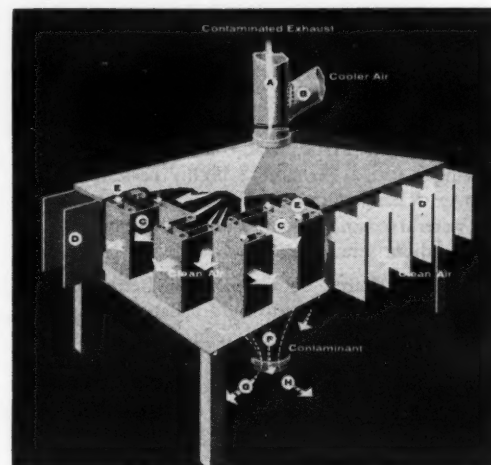
process makes use of existing plant equipment  
can also recover vapors

**Uses:** For removing odors and fumes, or recovering chemical vapors from industrial exhausts.

**Features:** Process is a self-contained unit which does not require costly or cumbersome maintenance. Unit permits effective use of activated carbon on hot, wet, or other exhausts. Regeneration is simple and inexpensive. Process fits in with normal operations and makes use of existing equipment.

**Description:** Industrial exhaust (any temperature or humidity), propelled by standard mechanical ventilation system, is passed through screened panel containing activated carbon. Number of panels depends on quantity of air to be cleaned. Typical individual panels are 12 feet square, (2 feet x 6 feet) and 1 or 2 inches thick. Frame is hollow tubing of aluminum or stainless steel.

If exhaust is extremely hot, cool outside air is mixed with exhaust (carbon will not absorb effectively above 100°F) just before it reaches the panel. When carbon in panel is "filled" (with adsorbed vapors),



Schematic diagram illustrates process for removing odors and fumes, or recovering chemical vapors

shutters seal off panel. This can be handled automatically by a control mechanism, based on time and quantity of exhaust that has flowed through panel.

Framework tubing is perforated, and superheated steam (at 300°F) is forced through the carbon, driving off absorbed vapors. If recovery is desired, the vapors driven off can be piped from the sealed panel to condensing or other recovery system. If destruction of contaminant is desired, it can be piped directly to a furnace (plant's existing unit) where complete combustion can occur.



**SCHUTZ-O'NEILL COMPANY**

PULVERIZERS • GRANULATORS • ROLLER MILLS • CYCLONES • SIFTERS • HAMMER MILLS

343 PORTLAND AVENUE • MINNEAPOLIS 15, MINNESOTA

When inquiring check CP 5820 opposite last page

## PROCESSING

Process permits great flexibility. If exhaust varies in volume, it can be sent directly through furnace which burns out the noxious gases when volume is small. When quantity increases, overflow passes automatically to panels for filtering.

While "filled" panels are being cleaned, other panels continue cleaning the exhaust. No extra pressure (other than that developed by the standard mechanical ventilation system) is needed to force exhaust through thin panels.

(Siftaire process is manufactured by The Chemurgic Process Corporation, Dept. CP, 55 West 42nd Street, New York 36, New York. Check CP 5821 on handy Reader Service slip which is located opposite last page.)

### Efficiencies up to 95% obtained with low-cost air filter

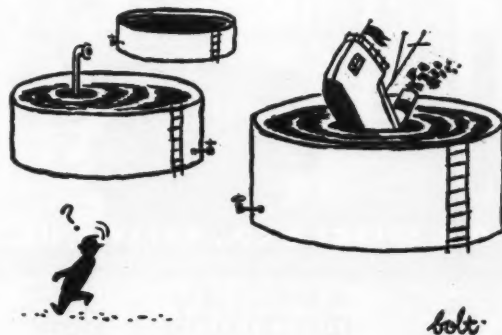
**Uses:** With process air conditioning systems in chemical, pharmaceutical, food, and other industries.

**Features:** Unit provides high filtering efficiency at low initial and operating costs. Lightweight cartridges can be replaced quickly, consist of glass fiber mats with deep-pleated design.

**Description:** Filter has permanent, cadmium-plated steel frame, which contains completely assembled filter cartridge. Three interchangeable cartridges are available, having efficiencies of 95, 85, and 35%. Based on test method, conventional filters have efficiencies of only five to 25%.

Initial pressure drops for cartridges range from 0.35" to 0.16". Filter is fire resistant and designed for long life. Overall dimensions of 1000 cfm unit are 24 x 14 x 12". Frames are designed for easy assembly into multi-filter banks.

(Aerosolve filters are product of Cambridge Filter Corp., Dept. CP, 738 Erie Boulevard East, Syracuse, N.Y. Check CP 5822 opposite last page.)



# WHICH *Figure Type* IS YOUR FORMED PRODUCT?

*Angular?*

*Hourglass?*

*Dion?*

**with SIMPSON MULLING**  
**all shapes are fashionable**



A new 12 page bulletin providing complete specifications, capacity requirements and industries served by Simpson Mix-Mullers is available on request.



The formed products shown above are about as unlike in use and method of forming as are the Paris fashions from one generation to the next—but like ladies' apparel, they have one thing in common... they must be designed and produced to fit.

Whether they're extruded, pelletized, briquetted or cast, formed products must be thoroughly, *intimately* mixed to insure uniform dispersion of moisture and binder. Lack of proper dispersion means poor green strength or resistance to deformation and breakage... rejects, if discovered prior to firing and *trouble* in the form of porosity, poor finish and shrinkage, if discovered after firing.

The photos have another thing in common—they're all selected from an *impressive* collection of tough jobs solved through controlled mulling in a Simpson Mix-Muller. If you mix... and it's dry but not a powder, wet... but not a fluid, it will pay you to find out why Simpson mulling is more economical, certainly more efficient than any ordinary mixing method you may now employ.

Available in 12 models in batch capacities of from 1/10 to 60 cu. ft., Simpson Mix-Mullers are serving every phase of the Chemical and Process Industry. Write for details and remember... mixing is our business, our principal business since 1914.

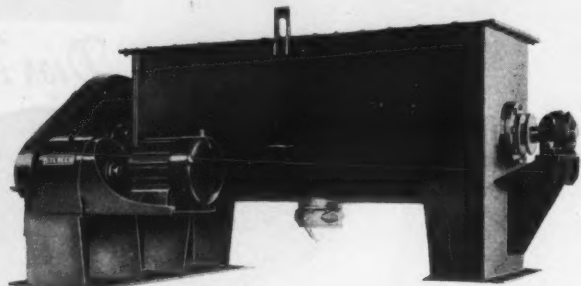


**SIMPSON MIX-MULLER® DIVISION**  
NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.  
(Not Inc.)



When inquiring check CP 5823 opposite last page

## The "Improved" STEVECO Line of Processing Equipment

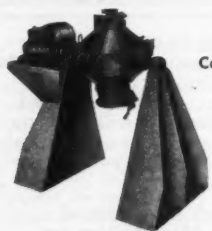


**Heavy Duty Ribbon Mixer** for rapid blending of dry or wet materials . . . extra heavy one-piece end plate construction, over-sized shaft and anti-friction roller bearings. Ribbon shaft flange-coupled within tub for easy removal. Many sizes available.

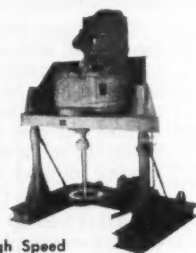
Steveco . . . "Standard of the World" since 1830 in the design and manufacture of mixing, blending, agitating and processing equipment for the chemical and ceramic industries . . . has added many superior features to its entire line. Whatever your processing problem may be, there is a newly improved Steveco machine that will give you outstanding performance. Write today for this new 20-page catalog on the Steveco line.



AGITATORS, Top Entering, Side Entering, Portable • BLENDERS • BALL AND PEBBLE MILLS • GRINDING MEDIA • CRUSHERS • SCREENS GRINDING PANS • MIXING PANS • MIXERS • PRESSURE VESSELS CHURNS • STORAGE TANKS • JAR MILLS • BLOWERS • FANS VENTILATORS



Conical Dry Blenders



Steveco High Speed Change Can Mixer

# STEVECO

**THE STEVENSON COMPANY**

225 N. Wilkinson St. • Dayton, Ohio

Plant: Wellsville, Ohio

Sales Representatives in Principal Cities

When inquiring check CP 5824 opposite last page

## PROCESSING

**Wide range of jar sizes handled by mill . . .**

proper spacing easily obtained by adjustable roll

**Uses:** For grinding and dispersing pigments, inks, and similar products.

**Features:** Jar rolling mill is so designed that 2 to 13"-diameter containers can be run on same unit. Correct space setting for jars is easily made by placing movable idler roll in proper notches.

**Description:** Entire unit is assembled on steel base plate. End supports are iron castings. Both fixed and movable rollers are equipped with sealed ball bearings that never require lubrication. Bearing troubles are eliminated and clean operation is assured. Mill is available in 15 and 24" lengths.

(Jar rolling mill is product of Paul O. Abbe, Inc., Dept. CP, Center Street, Little Falls, New Jersey . . . or for more information check CP 5825 on handy form opposite last page.)

**Solids are reduced to 1 ppm by self-cleaning scrubber**

Scrubbers which remove entrainment in three stages and reduce solids content of vapors or gases to 1.0 ppm, are described in four-page bulletin. Advantages summarized include higher efficiency, elimination of baffles, and self cleaning.

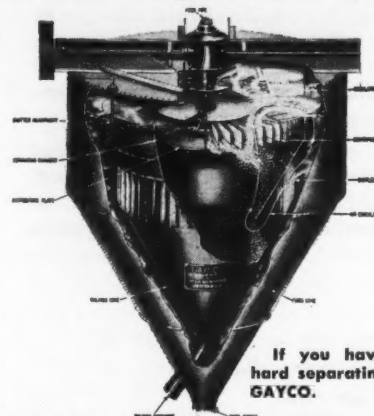
Folder contains dimensional drawings of installations and a cut-away view showing flow of vapor through unit. Specifications and dimensions are also included.

Bul 103 is issued by The V. D. Anderson Company, Dept. CP, 1935 West 96th Street, Cleveland 2, Ohio. When inquiring about manufacturer's product reader may simply specify CP 5826 on handy form opposite last page.

## GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

**"TIMKEN BEARING EQUIPPED"**  
GAYCO brings you all these:



Range 60 to 400 mesh  
greater capacity  
25 to 30% greater production  
Cleaner Tailings  
Uniform Products  
Slow speed for slow wear  
Quick and easy adjustments

If you have an exceptionally hard separating problem, TRY THE GAYCO.

## Universal Road Machinery Co.

Robert M. Gay-Division  
Factory and Laboratory, Kingston, N. Y.  
117 LIBERTY STREET NEW YORK 6, N. Y.  
Canadian Representative: F. H. Hopkins & Co., Ltd.,  
3500 Decarie Blvd., Montreal, Que.

When inquiring check CP 5827 opposite last page

## SPERRY



APPLIED  
EXPERIENCE  
FOR YOUR

FILTRATION PROBLEM

New is a relative word. A seemingly new filtration problem may well be "old hat" to Sperry, whose unparalleled record in servicing the needs of industry for over 60 years provides the answer to Superior Filtration — at lower cost!

New is also an important word, used here to introduce the New Sperry Catalog and Specifications Book. Fact finding, easy reading, timely. Send for your free copy, today.



**D. R. SPERRY & CO., BATAVIA, ILL.**

Filtration Engineers for Over 50 Years

Eastern Sales Reps:  
George S. Tarbox  
808 Nepperhan Ave.  
Yonkers 3, N. Y.  
Yonkers 5-8400

**SPERRY  
FILTER PRESSES**

Western Sales Reps:  
B. M. Pihosky  
833 March, Ench. Bldg.,  
San Francisco 4, Calif.  
DO 2-0573

When inquiring check CP 5828 opposite last page

CHEMICAL PROCESSING

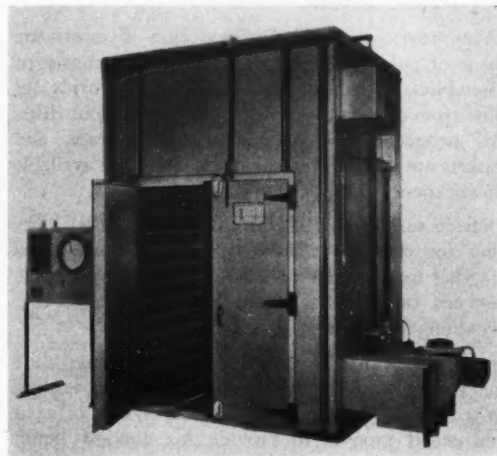
## PROCESSING

### Heaters hooked to door switches on curing oven . . .

can not function unless doors are closed

**Uses:** For curing rubber or plastic components such as silicones, Teflon, reinforced fiber glass, high-pressure hose, polyester resins, and other polymerizing compounds.

**Features:** Heaters are connected to door switches, permitting no heating to occur unless doors are closed. Cross-flow circulation assures uniform temps.



Curing oven has two separate exhausts, cross-flow air circulation

**Description:** Air enters oven through slots on inside walls, at same level as trays. Heaters operate at voltages up to 550v and have single and double circuits. Centrifugal blower circulates air.

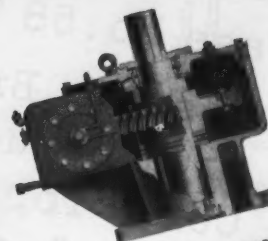
Oven has two separate exhausts — one for continuous normal exhaust and one for after-bake purging and cooling. Automatic timer opens or closes second ventilator at proper time.

If desired, unit comes with doors at both ends. Walls and roof are built of 22-gage aluminized steel. Double-wall construction encloses wool insulation. Panels are internally reinforced to prevent bulging and insulation settlement.

(Model 3359 curing oven is product of Lydon Brothers, Inc., Dept. CP, 85B Zabriskie Street, Hackensack, N.J. Check CP 5829 opposite last page.)

### For a guide to processing ideas . . .

You'll find what you need in the handy Product Directory on pages 201 to 204. All products and processes are listed there.



Left—Cleveland 100 AT and 500 VT worm gear reducers driving feeder tables in a large mid-western plant. Above—cutaway of an 800 VT feeder table unit shows one-piece gear shaft construction. Since 1912, Cleveland has concentrated its entire engineering and manufacturing effort on worm gearing—your assurance of correct design, precision workmanship and complete dependability.

## Perfect feed control begins with CLEVELAND drives

**NO MATTER** what materials you process, wet or dry, maintain steady feed rates at all times.

Cleveland has spent over a quarter century in the continuous development of feeder table drives. A rugged one-piece gear shaft construction carries thrust directly to the base of the unit. This design eliminates distortion and warping of housings under high thrust loads. Thus, wear-resistant case-hardened steel worm and nickel-bronze gear are always in perfect contact to transmit power smoothly and dependably.

You'll find hundreds of Clevelands at work in ore beneficiation and sintering operations, cement, stone-processing and coal preparation plants. Many outlast the machines they drive. *ALL* are run in at the factory before delivery!

Get more feeder table drive information by writing for free Bulletin 140. The Cleveland Worm and Gear Company, 3257 East 80th Street, Cleveland 4, Ohio. Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



When inquiring check CP 5830 opposite last page

**Case No. 58**  
**Results Bring Re-Order**  
**from Heyden Chemical**  
**Corp. for Second Kemp**  
**Inert Gas Generator**

**Heyden Chemical**  
**doubles its blanketing**  
**savings with**  
**Second Kemp Generator**

**H**ERE'S A CASE where simple mathematics paid big dividends at this Garfield, New Jersey plant. When Heyden Chemical—one of the nation's leading producers of formaldehyde, pentaerythritol, salicylic acid, etc.—installed its first Kemp Inert Gas Generator to furnish CO<sub>2</sub> for blanketing a special grinding operation, it was on more or less a test basis. Part of Heyden's constant search for newer, better, cheaper ways to improve its products. The rest of its blanketing needs were still being handled with CO<sub>2</sub> from large storage tanks in the plant.

**Immediate Savings with Kemp**

Results with the first Kemp Inert Producer were impressive. Now a second (see right) Kemp unit has been installed and actual savings over previous costs are estimated at over \$500 a month for the first year. In addition to dollars saved, Kemp Generators assure a safe, dependable supply of chemically clean inerts. Deliver inerts at a special analysis . . . without fluctuations.

**Kemp Designs Versatile**

If you still rely on old-fashioned inert sources or are dissatisfied with present inert equipment, let Kemp help you, too. Kemp Engineers will be most happy to help solve your inert problems . . . show you how you can get similar results with fast-starting, easy-to-operate Kemp Generators. It costs you nothing to investigate. And it may save you real money.

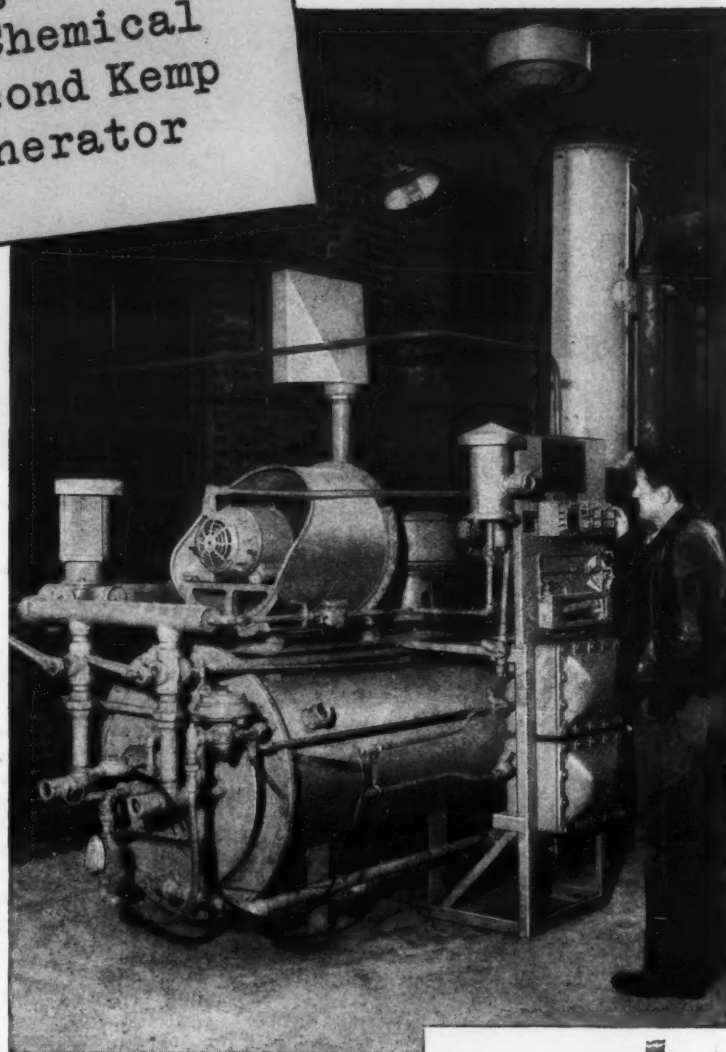
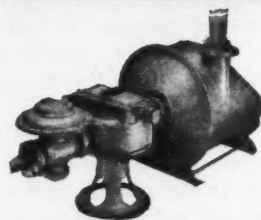
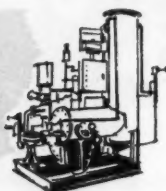


Photo at right shows close-up view of Kemp Industrial Carburetor. Part of every Kemp installation, it eliminates tinkering, waste. Assures complete combustion at all times. Reduces installation costs and maintenance.



For more complete facts and technical information, write for Bulletin I-10 to:  
**C. M. KEMP MFG. CO., 405 East Oliver Street, Baltimore 2, Maryland.**

**KEMP**  
**OF BALTIMORE**



**INERT GAS GENERATORS**

**CARBURETORS • BURNERS • FIRE CHECKS**  
**METAL MELTING UNITS • ADSORPTIVE**  
**DRYERS • SINGEING EQUIPMENT**

When inquiring check CP 5831 opposite last page

**PROCESSING**

**Porous fluorocarbon filter elements**  
**remove 5-micron particles,**  
**resist corrosives . . .**

lightweight units withstand temperatures up to 300°F, are easily cleaned

**Uses:** For filtering corrosive acids, caustics, oxidizing agents, and common organic solvents.

**Features:** Porous filter removes particles down to 5 microns in size. Inert fluorocarbon element is compact, lightweight, and withstands temperatures up to 300°F. It is highly resistant to acids, caustics, and organic solvents.

**Description:** Kel-F Discpax filter elements are made of polychlorotrifluoroethylene. Units consist of assemblies of pairs of discs arranged to provide for flow from outside to inside through the porous discs. All necessary flow passageways, cake space, and gaskets are molded into the discs, which are available in thicknesses of 1/16" and 1/8".

Outside surface of each disc provides a raised inner ring for complete closure, while peripheral raised ring has molded into it the flow passageways. Surface between two rings is depressed 0.008" to 0.010", providing cake space for solids collection.

Inside face of disc has complete peripheral ring, while inner ring is molded with fluid passageways leading to center hole. Face is interlaced with system of axial and radial grooves to provide for flow of liquid towards center hole. Filters are easily cleaned. Elements are available in diameters ranging from 53/64" (0.037 sq ft filter area) to 3 1/2" (5.0 sq ft filter area). Overall length ranges from 1.7 to 4.1". All have threaded end connections.

(Porous fluorocarbon filter elements are product of Porous Plastic Filter Company, A Pall Filtration Company, Dept. CP, 30 Sea Cliff Avenue, Glen Cove, N.Y. . . . or for more information about manufacturer's product reader may simply check CP 5832 on the convenient Reader Service slip which is located opposite last page.)

**Improve dust collecting efficiency**  
**with multi-cyclone system . . .**

secondary circuit, under negative pressure, prevents recycling of dust particles

**Uses:** Collector is designed to remove or recover all kinds of dusts in chemical, cement, metal working, and other plants.

**Features:** Unit is adaptable to high or low temperature gases containing small and large abrasive or non-abrasive particles. Secondary circuit on collector is under negative pressure, and prevents dust from recycling into primary system.

**Description:** Collector differs from conventional

units by having a secondary recovery system following the primary system. Consisting of a number of small cyclones, the constant suction maintained by the secondary circuit insures uniform and rapid discharge of dust.

Small cyclones are installed in parallel and have tangential inlets. Units are cast from abrasion-resistant gray iron, and are fastened to housing by single bolt and nut. Collection efficiency is only slightly affected by variations in gas volume. Collection efficiency for dust particles in range of zero to 15 microns is said to be greatly improved over conventional systems lacking a secondary circuit.

(Paralcone dust collector is product of Aerodyne Development Corporation, Dept. CP, 1520 Lakeside Avenue, Cleveland, Ohio . . . or for more information check CP 5833 on handy form opposite last page.)

### Overheating, shutdown eliminated by water cooling arrangement on vacuum molding presses

Continuous 'round-the-clock vacuum forming — without production delays or interruptions — is possible by water cooling arrangement within mold clamp frame assembly of molding presses. Set-up overcomes past drawback to continuous production, when overheated frame caused softening and distortion of the thermoplastic material clamped down for positioning.

Avoidance of overheating also eliminates possibility of frame becoming bound or jammed by metal expansion after several hours of operation. Cooling arrangement is standard on manufacturer's new VacForm presses and can be added to existing equipment (of same make) in most cases.

(Molding machines are product of Vacuum Forming Corporation, Dept. CP, 76 South Bayles Avenue, Port Washington, N. Y. . . . or for more information check CP 5834 on handy form opposite last page.)

### Wire cloth parts fabricated in all weaves, metals


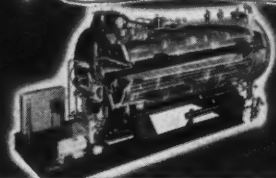

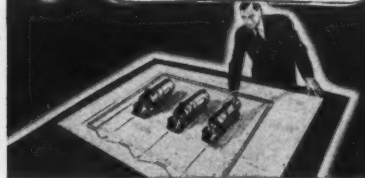

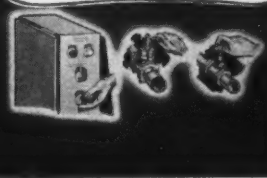






Fabrication of wire cloth screens and parts is covered in eight-page bulletin. Fully illustrated with photographs, bulletin shows company's manufacturing facilities and examples of components being produced. Parts can be made of all malleable metals and in any weave desired.

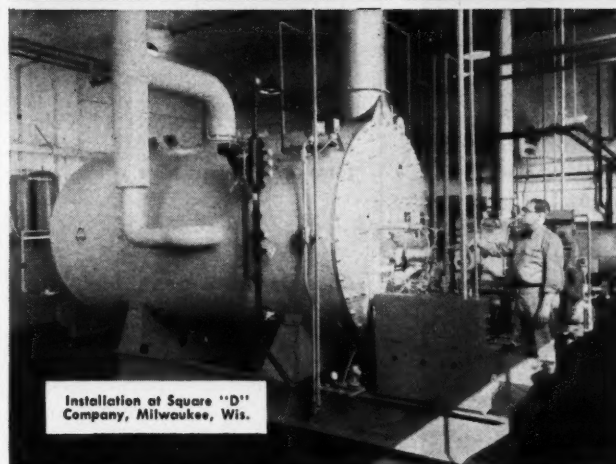
"Fabricated Wire Cloth Parts" is issued by Newark Wire Cloth Company, Dept. CP, 351-365 Verona Avenue, Newark 4, New Jersey. When inquiring specify CP 5835 on handy form opposite last page.



## CLEAVER-BROOKS SELF-CONTAINED BOILERS HAVE THE FEATURES EVERYONE WANTS!

...which feature would be most important to you?

|   |   |  |
|---|---|--|
|  <p><b>PLANT OWNER</b></p> <p>• "Cleaver-Brooks boilers are tops in fuel economy! Forced-draft, four-pass construction and 5 sq. ft. of heating surface per boiler H.P. assure me 80% operating efficiency when firing with oil."</p>                                 |  <p><b>ARCHITECT</b></p> <p>• "Self-contained design certainly simplifies boiler room planning — gives owners maximum use from each square foot of space. Gives me flexibility to make best use of low head room conditions."</p>   |  <p><b>CONSULTING ENGINEER</b></p> <p>• "Oil, gas and combination oil/gas firing lets me recommend Cleaver-Brooks boilers for installation anywhere. Exclusive burner design makes it possible to interchange gas/oil firing in 10 seconds."</p>         |
|  <p><b>CONTRACTOR</b></p> <p>• "Boilers are shipped ready to install. With service lines in, my crews have boilers ready for operation in 24 hours or less after delivery. No foundation or stack problems. Cleaver-Brooks furnishes starting service, too."</p>  |  <p><b>PLANT SUPERINTENDENT</b></p> <p>• "I get all the steam I need for fluctuating steam demands, from full load down to 30% of rating. Automatic burner controls assure instant firing. I call that real dependability."</p>  |  <p><b>OPERATING ENGINEER</b></p> <p>• "Cleaver-Brooks boilers sure are simple to maintain. No more smoke, ashes, clinkers or messy boiler-room conditions. What's more, I get performance I can count on — backed by factory and on-job tests."</p>  |



Installation at Square "D" Company, Milwaukee, Wis.

THESE are just a few of the many outstanding features that have made more than 15,000 individual Cleaver-Brooks self-contained boilers *first choice* for commercial, institutional and industrial applications. Get in touch with your nearest Cleaver-Brooks representative for complete facts, or write for catalog AD-100. Cleaver-Brooks Co., Dept. C, 349 E. Keefe Ave., Milwaukee 12, Wis., U.S.A. — Cable address: **CLEBRO** — Milwaukee — all codes.

**Cleaver Brooks**

"It's NEW — get the facts on the CB boiler — write today!"

BOILERS — STEAM OR HOT WATER — FOR HEATING OR PROCESSING IN SIZES FROM 15 TO 500 HP, 15 TO 250 PSI.

NOW — FIRST SIZES OF THE CB BOILER ARE MADE IN CANADA, TOO.

When inquiring check CP 5836 opposite last page



Case History 113

## \$360 PER DAY SAVED BY RECOVERING CHEMICALS FROM EXHAUST SYSTEM!

### EQUIPMENT REQUIRED:

One upflow Line Type Hi-eF Purifier (Type LUS4-150)

### SERVICES:

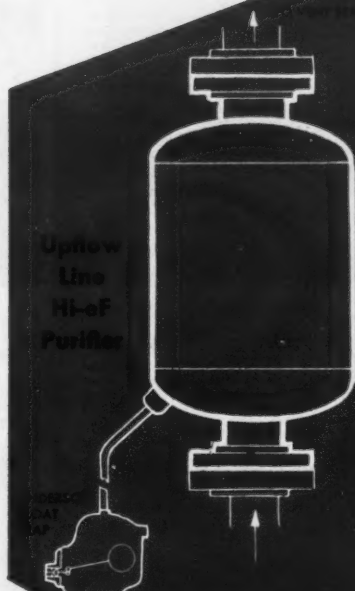
The purpose of this installation in a large New Jersey chemical plant was to remove methanol droplets entrained at the rate of 500 pounds per hour in ether. The purifier was installed in a vertical upflow position at the base of a vent stack to handle 135 CFM of ether vapor at 35 degrees C and 10 to 20 PSIG.

### RESULTS:

The Hi-eF Purifier recovered \$360 worth of methanol during the first day of operation. The subject concern was so pleased with the results that additional units were purchased for similar operations.

Hi-eF Purifiers quickly pay for themselves by removing (1) liquids, scale, etc. from gas and air lines (2) entrainment from vapor lines following evaporation and (3) condensate from compressed air lines. Write us about your problem.

**The V. D. ANDERSON Company**  
1959 West 96th Street, Cleveland 2, Ohio  
Subsidiary of Chesapeake Industries, Inc.



**Free!**

Write for  
Bulletins 201 and 700  
for many money-saving  
applications with Hi-eF  
Line Type Purifiers.

# ANDERSON

## Hi-eF® PURIFIERS



When inquiring check CP 5837 opposite last page

### PROCESSING

#### Has capacity calculator for centrifuges

How to determine if a centrifuge will work in your process and what size is needed, is told in two-page folder. Bulletin contains centrifuge capacity calculator with instructions for its use. Pilot plant model centrifuge with speeds up to 9000 rpm is also pictured and described.

"Two Methods of Evaluating Merco Centrifuges" is issued by Merco Centrifugal Company, Dept. CP, 150 Green Street, San Francisco, California. When inquiring specify CP 5838 on handy form opposite last page.

#### Offer package pilot plant for ore and mineral processing work

Complete pilot plant, consisting of crusher, ball mill, classifier, pumps, conditioner, flotation machine and table, is available for ore, mineral, and similar processing mills and plants.

Design is flexible enough so that other elements of crushing, grinding, screening, and concentration may be added as needed.

Unit is supplied with structural steel base and all pieces are match-marked for assembly at destination.

(Pilot plants are made by Denver Equipment Company, Dept. CP, P.O. Box 5268, Denver 17, Colorado. Check CP 5839 on handy form opposite last page.)

#### Compact filter available in various materials of construction . . .

designed for use in electroplating and electroforming

**Uses:** Units are designed especially for use in electroplating and electroforming industries.

**Features:** Compact, simple-to-

## You gotta be first to be best!\*



\*25 years ago, Alloy Fabricators started to build Stainless Steel, Monel, Inconel, Nickel and Aluminum Process Equipment. With this experience, naturally, they're your best bet today!

**It's Still Our Only Business  
— And We Mind It Well!**



### ALLOY FABRICATORS

DIVISION OF CONTINENTAL COPPER AND STEEL INDUSTRIES, INC.  
PERTH AMBOY, NEW JERSEY

When inquiring check CP 5840 opposite last page

## SMOOTH—VIBRATIONLESS PROPELLERS

### for MIXING, STIRRING AERATING, PUMPING, etc.

Manufactured by an exclusive process, MICHIGAN propellers are perfectly balanced to avoid whip and strain on shafts. And because of their superior functioning are now standard parts of the products of many leading equipment manufacturers.

**Available** for special application and replacement, as well as original equipment, in a wide variety of metals and in sizes up to 60". Write for latest data folder.



Side Entering Mixer by  
**EASTERN INDUSTRIES**  
NEW HAVEN, CONN.

## MICHIGAN WHEEL CO.

GRAND RAPIDS 3, MICH.

When inquiring check CP 5841 opposite last page

CHEMICAL PROCESSING

## PROCESSING

operate filters are easy to assemble and disassemble. Units are available in iron, stainless steel, rubber, or plastic, for use with all kinds of corrosive solutions.

**Description:** Series of cartridge-type filter units ranges in capacity from 100 to 5000 gal per hour. Units consist of filter chamber with a ten-inch honey-comb filter tube, centrifugal pump, totally-enclosed motor, piping, and discharge control valve. Filters come completely assembled, mounted on sturdy bedplate.

Cartridges are easily replaced and are available in cotton, dynel, orlon, glass, acetate, or nylon.

(Filters are product of Comco, Inc., Division of Enthone, Inc., Dept. CP, 442 Elm Street, New Haven, Conn. Check CP 5842 opposite last page.)

### Versatile mills fill need for every purpose

Line of mills and size-reduction equipment is pictured and described in two-color fold-out bulletin. Units are available in sizes, styles, and combinations for every processing need. More than 200 blade designs are offered.

Numerous feed throats, screens, rotors, and shafts are illustrated. Over 50 applications are listed — showing unit involved. Applications covered include chemical, petroleum, pharmaceutical, rubber, textiles, foods, and other industries. Manufacturer's testing facilities and services are also shown and described.

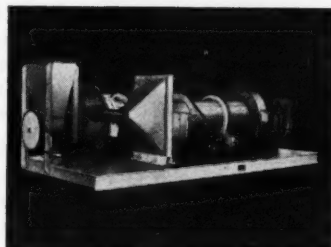
Mill bulletin is issued by The W. J. Fitzpatrick Company, Dept. CP, 1001 W. Washington Boulevard, Chicago 7, Illinois. Specify CP 5843 opposite last page.

For more information on product at right, specify CP 5844 . . . see information request blank opposite last page.



direct fired

# Rotary Kilns



Special Stainless Steel Dryer for Processing a Costly Anti-Biotic without Contamination.



Calciner and Cooler for Continuous Processing at Temperatures from 900° F. to 2100° F.

**Oil fired units can be rotated at speeds ranging from 2 Rev./Hr. to 5 Rev./Min. to control the length of time the material is under treatment.**

Temperatures range from 1000° F. to 2200° F. depending upon the material being handled. Burners are controlled automatically with radiation pyrometers. Heated material is passed through a Bartlett-Snow externally water cooled cooler — and cooled slowly, at gradually declining temperatures. Use Bartlett-Snow's complete facilities — including materials handling — on your next job. It fixes unit responsibility — assures the smooth synchronized operation of the entire project — and utmost economy and satisfaction.

DESIGNERS

ENGINEERS

**BARTLETT  
B-SNOW**  
CLEVELAND 5, OHIO

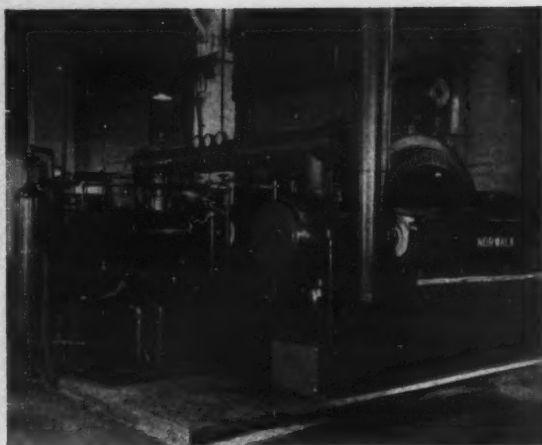
FABRICATORS

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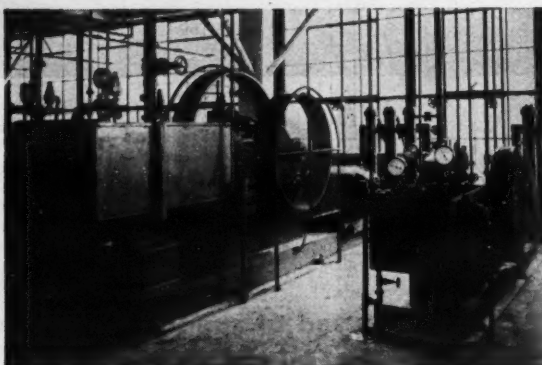
*Dryers • Coolers • Calciners • Kilns*

"Builders of Equipment for People You Know"

## NORWALK compressors in use



Three stage duplex air compressor for 1000 pounds pressure, located in a large industrial plant



Acetylene compressors in a large industrial plant

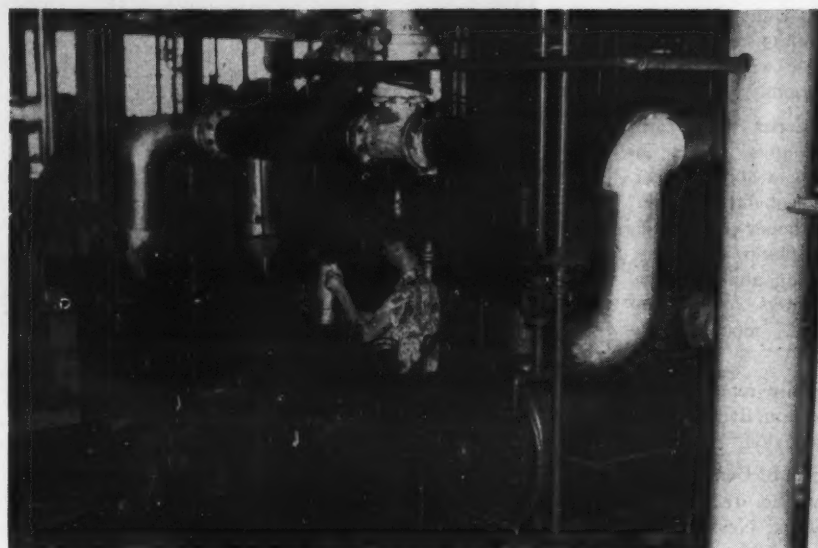
Reversible ring plate valves, force feed lubrication, sealing type piston rings, generous intercooler coils are some of the features (common to all Norwalk compressors) that make for efficiency and long-term economy. Descriptive catalog mailed on request.



**NORWALK COMPANY, INC.**  
South Norwalk, Connecticut  
Makers of high pressure compressors  
for 91 years 1864-1955

When inquiring check CP 5845 opposite last page

## engineering and maintenance



Lubricating one of four compressors used at Mississippi Chemical Corp., for production of nitric acid from ammonia

By permitting higher operating temperature  
on power cylinders, polyalkylene glycol lubricant —

## increases compressor efficiency 20%

W. B. DUNWOODY, General Operations Manager  
Mississippi Chemical Corporation  
Yazoo City, Mississippi  
with ROY G. HELSING, Assistant Editor

**Problem:** Every two months it was necessary to shut down four XRD Ingersoll-Rand 350 hp compressors at the plant of Mississippi Chemical Corp., Yazoo City, Miss., for general overhaul of power cylinders to remove carbon deposits and clean up machines. These frequent shutdowns were not only costly from the maintenance and lost-production standpoints; but carbon deposition was also contributing to abnormal wear on the compressor cylinders. Temperature of waste gases used to operate power cylinders had to be held to 400°F because of breakdown of lubricant which caused carbon deposits in the cylinders.

Air from these compressors is used for the oxidation of ammonia to produce nitric acid, which is eventually used to manufacture ammonium nitrate.

**Solution:** About a year ago, Mississippi Chemical began using Ucon lubricants, which are syn-

thetic organic chemicals known as polyalkylene glycols and derivatives. They were chosen because of their resistance to sludging and carbonization. The particular type used in the compressors is water-insoluble.

Viscosities of various lubricants in the Ucon series range from 50 to between 60,000 and 90,000 SUS at 100°F. No wax or other pour point depressants are used. ASTM pour point is stable and is as low as -85°F for some lubricants in the series. Additives may be used for improving oxidation stability, load carrying capacity, and other effects.

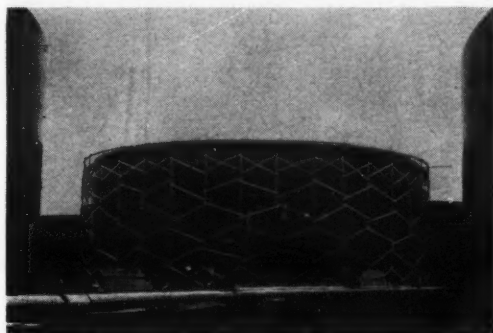
**Results:** Use of these lubricants enabled Mississippi Chemical to increase the operating temperature on the power cylinders from 400 to 460°F. Available power for compressing air has been increased 20%. Compressors have operated for over a year without shutdown. A considerable saving in maintenance cost in addition to increased nitric acid production has been realized.

(Ucon high-temperature lubricants are products of Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd. St., New York 17, N. Y. . . . or for more information check CP 5846 on handy form opposite last page.)

## "Overcoats" of insulation cut steam costs in heating oil

**Cellular glass blocks won't rot or deteriorate, show excellent resistance to acids and fumes**

To avoid excessive steam costs incurred in maintaining oil in four huge storage tanks at a constant 120°F, officials at the Fuel Oil Corp. of River Rouge, Mich., decided to insulate the structures. Cellular glass insulation was chosen for the job because it is impervious to moisture, highly resistant to acids and acid fumes, and will not rot or deteriorate. This was important since the tanks are located in a heavily built-up industrial area in Michigan.

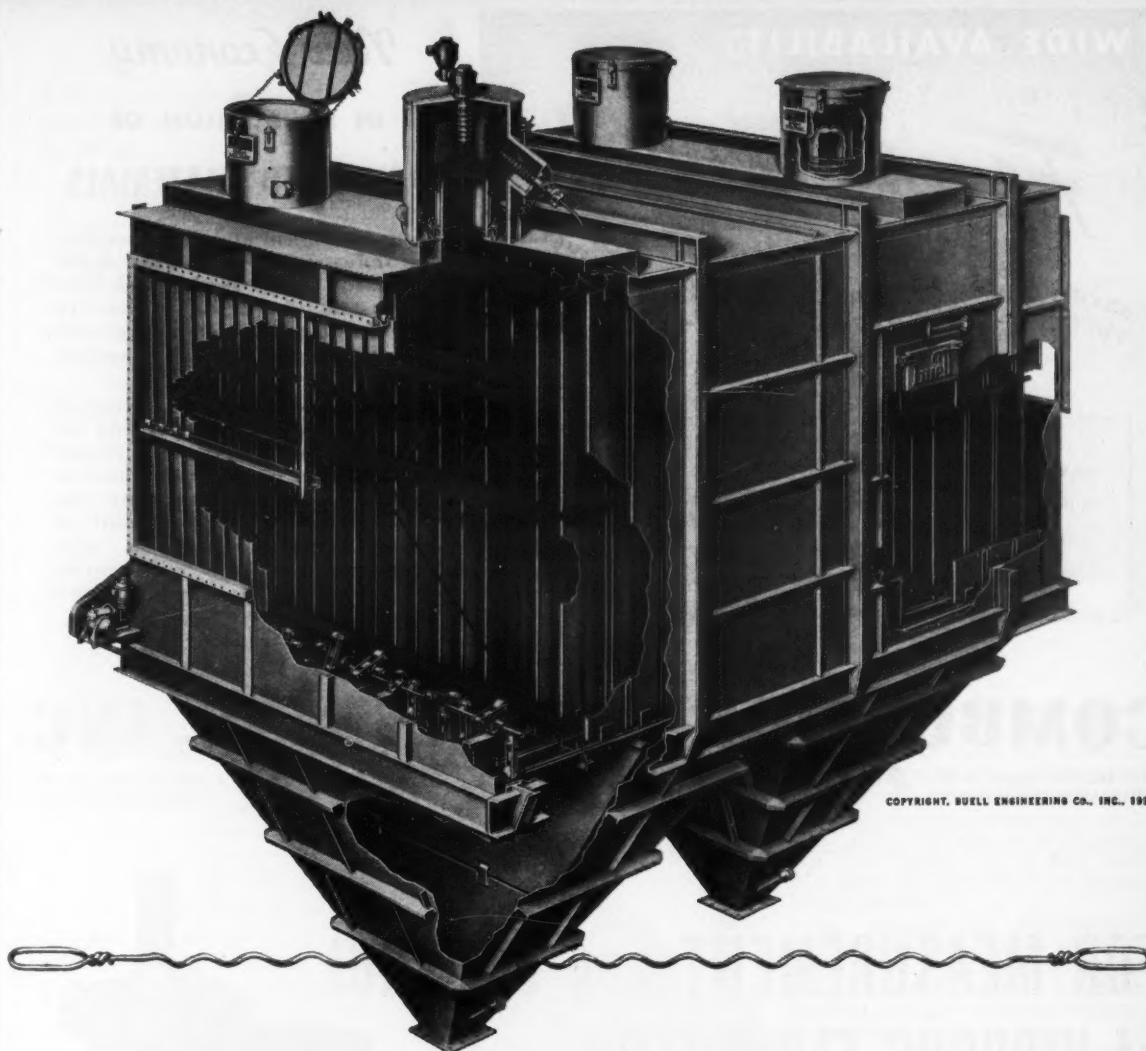


Huge tank (center) is one of four getting "overcoat" of cellular glass insulation to help maintain stored oil at a constant 120°F

The company had formerly been using waste steam from a nearby steel plant. However, the steel firm needed the steam elsewhere and was unable to supply an adequate amount. To cut the necessary steam costs, over 50,000 sq ft of cellular glass insulation, called Foamglas, was applied to the four tanks, the largest of which is 117' in diameter and 41'-10" high.

In installing the "overcoats", 2" thick blocks of insulation were banded to the tanks. These were then sprayed with a coat of asphalt cutback. Asphalt-impregnated glass fabric was imbedded in this coat and asphalt cutback sprayed on as the final coat.

(Cellular glass insulation is a product of Pittsburgh Corning Corporation, Department CP, One Gateway Center, Pittsburgh 22, Pennsylvania. . . or for more information about the manufacturer's product, reader may simply check CP 5847 on the convenient Reader Service slip which is located opposite last page.)



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## World's Most Effective Dust Collector

From Pennsylvania to Peru . . . the Buell 'SF' Electric Precipitator is establishing new records for dust recovery.

Whether your interest is efficiency . . . low maintenance costs . . . greater dependability . . . you'll find them all demonstrated in the *daily* operating records kept by our customers. We invite you to inspect them from *any* angle.

We'll be glad to give you the name of one near you, so you can *see for yourself* how Buell 'SF' Electric

Precipitators recover as much as 40 tons daily . . . how they often provide a handsome *cash* return.

Take a good long look at such exclusive features as the Buell 'Spiralelectrode' which is unequalled for effective dust precipitation.

Write today for your complimentary copy of our Brochure which describes *all three* Buell Systems—The Collection and Recovery of Industrial Dust. Write Dept. 11-C, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

**buell**



20 Years of Engineered Efficiency in  
**DUST COLLECTION SYSTEMS**

When inquiring check CP 5848 opposite last page

WIDE AVAILABILITY

*New Economy*

IN PRODUCTION OF

## POWDERED MATERIALS

In the chemical and food processing industries there is wide application for the Raymond Flash Drying System, where products have to be reduced to powdered form and simultaneously dried to a specified moisture content.

This method gives close control over the finished product and assures important savings because the operation is automatic, dustless and economical in handling the material. It is highly efficient in producing fine chemicals, pigments, clays, hydrate compounds, powdered foods and various manufactured products.

*If your problem involves any of the operations, shown above, let Raymond engineers advise you on the proper equipment to use.*

For further details, write for this today.

RAYMOND  
Flash Drying  
CATALOG  
No. 54A

# COMBUSTION ENGINEERING, INC., *Raymond Division*

1317 NORTH BRANCH ST.  
CHICAGO 22, ILLINOIS

SALES OFFICES IN  
PRINCIPAL CITIES

When inquiring check CP 5849 opposite last page

## FOR MEASUREMENT and CONTROL of VISCOUS FLUID FLOW...

### the **ASKANIA** TRANSOMETER

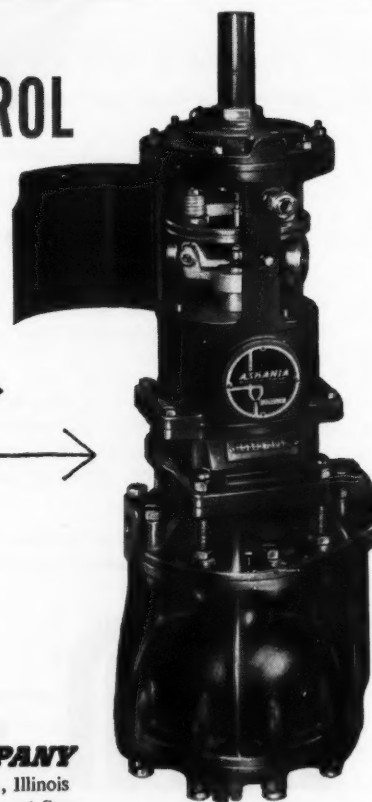
Designed for fuel oil and other viscous liquids, the Askania Transometer accurately measures flow and transmits a corresponding pneumatic signal.

This signal can be in the range of inches w. c., to match equivalent gas flow measurement; or in the standard instrument transmitter range of 3-15 p.s.i.

Sturdy Askania construction, over-range protection, built-in integrator, wide range. Write for Bulletin 125.

**ASKANIA**  **REGULATOR COMPANY**  
243 E. Ontario Street, Chicago 11, Illinois  
Subsidiary of General Precision Equipment Corp.

When inquiring check CP 5850 opposite last page



## ENGINEERING AND MAINTENANCE

**Drains moisture automatically and continuously from gas, steam pipe systems . . .**

low-cost float trap is suitable for pressures up to 200 psig

*Uses:* On air, gas, and steam applications.

*Features:* Unit has good capacities for its size. It is designed as a low cost method of draining moisture and condensate continuously and automatically from piping systems.

Traps are suitable for operating pressures up to 200 psig. They have an optional inlet for ease of installation in pipe lines.

*Description:* Moisture trap, designated No. 81, consists of a stainless steel valve and seat, and lever, plus a durable copper hide float inside a cast semi-steel case. Stainless steel float can be furnished when specified.



Moisture trap has optional inlet for ease of installation

Valve is opened by liquid raising float and closed when float drops the liquid level. Traps are furnished with either 1/2 or 3/4" connections.

(Moisture trap is a product of The V. D. Anderson Co., Dept. CP, 1935 W. 96th St., Cleveland 2, Ohio . . . check CP 5851 opposite last page.)

Specific heats for hydrocarbons—see nomograph on page 190

## Plastic TYGON TUBING

**FLEXIBLE AS STRING . . . GLASS-CLEAR . . . FEATHER-LIGHT . . . FULLY RESISTANT TO ACIDS, ALKALIES, OILS, GREASES, AND WATERS . . . MIRROR-SMOOTH . . . TOUGH AS LEATHER . . . NON-OXIDIZING . . . NON-TOXIC . . . LONG-WEARING . . . FOR THE TRANSMISSION OF LIQUIDS, GASES, AND SEMI-SOLIDS.**

TYGON Tubing is available in six standard compounds—continuous lengths—bores up to 2" ID—with or without outer braid reinforcement. Special compounds and sizes made to order.

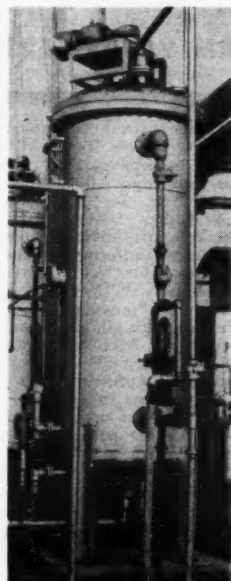
Write, today, for detailed information and technical Bulletin T-77!

202C

**U. S. STONEWARE**  
AKRON 9, OHIO  
PLASTICS AND SYNTHETICS DIVISION

When inquiring check CP 5852 opposite last page

## Efficient/Practical SOLVENT EXTRACTION AT LOW COST



The York-Scheibel multi-stage extraction column is ideal for simple counter-current extraction; and for fractional liquid extraction in which the feed material is simultaneously contacted by two selective and immiscible solvents.

Check these features . . .

- POSITIVE MIXING
- POSITIVE PHASE SEPARATION
- SINGLE, COMPACT COLUMN
- HIGH THROUGHOUT CAPACITY
- HIGH EFFICIENCY
- LOW STAGE HEIGHT
- LOW COST PER STAGE.

**YORK**

YORK PROCESS EQUIPMENT CORP.  
4 Central Avenue  
WEST ORANGE, N. J.

Complete illustrated catalog available describing laboratory, pilot plant and large scale extraction columns.

When inquiring check CP 5853 opposite last page

MARCH, 1955

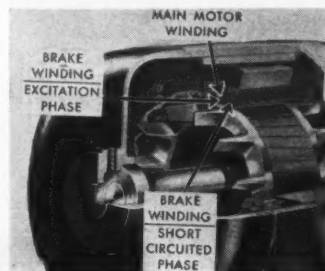
## MAINTENANCE

**Brakes are built-in on standard motors to 30 hp**

**Uses:** On trolley and crane drives, conveyors, textile and special machinery.

**Features:** Braking can be built into all of company's regular line of standard motors, right angle and gearmotors and mechanical variable speed drives.

Braking action is a two-stage process providing a smooth stop.



Braking can be built into standard motors with no limitations as to mountings, enclosures, or speeds

**Description:** AC dynamic brake motor is available up to 30 hp. Compact, with no moving parts, no wear or adjustment, this dynamic braking is built right into standard frame size single or polyphase induction motors. There are no limitations as to mountings, enclosures, electrical characteristics, speeds or special mechanical modifications.

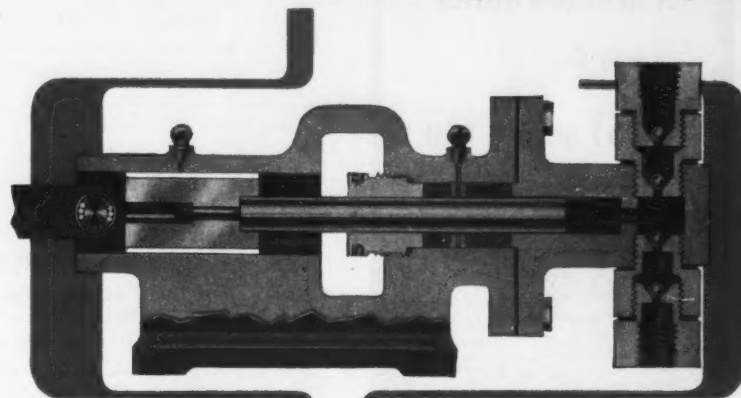
(Brake motor is a product of Master Electric Co., Dept. CP, 126-89 Davis Ave., Dayton, Ohio . . . or check CP 5854 opp. last page.)

### Lists publications of ASA

Publications of American Standards for the chemical and allied industries are included in 48-page booklet. Listings are presented both by title of standard and by industry.

"American Standards", March 1954, is available on letterhead request to American Standards Association, Inc., Dept. CP, 70 E. 45th St., New York 17, N.Y.

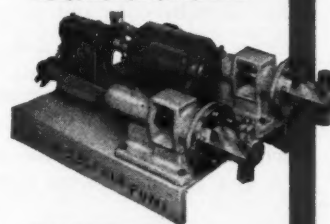
## Engineers who know pumps best ... select Philadelphia Pumps



Simplex Pump, Model S-501 for controlled capacities from 5 cc per minute to 5 gph. Pressures to 1500 psi.



Philadelphia Pump showing rocker arm micro-adjustment for varying pump capacity in operation.



Heavy Duty Duplex Pump, Model S-3032 for controlled capacities to 750 gph. and pressures to 10,000 psi.

Philadelphia controlled capacity chemical pumps are designed for pump men—to meet the practical requirements of low initial cost, operating and maintenance economy.

Design features dependable, common sense, low cost arrangements that offer better service with less grief than any other chemical pump on the market.

For instance all Philadelphia Pumps are constructed to allow removal of all moving parts through the oversized crosshead without breaking piping connections—a great advantage in maintenance.

Packing gland is easily accessible at both ends.

Valves of liquid ends are machined of solid stainless steel bar, thus eliminating pressed seats which can work loose in operation.

All Philadelphia Pumps feature strong, rugged construction.

Automatic capacity control mechanisms include conventional rocker arm with Micro-adjustment, Uni-Feeder and patented "Philatrol."

For complete description of Philadelphia Pumps and Pump Selection Chart, write for new Bulletin S-1254. PHILADELPHIA PUMP & Machinery Co., Inc., 1513 Race St., Phila. 2, Pa.

**PHILADELPHIA PUMP**  
AND MACHINERY COMPANY, INC.

SUBSIDIARY OF AMERICAN METER COMPANY / EST. 1836

When inquiring check CP 5855 opposite last page

Time the flow of  
Gas... Liquids... Solids  
in Split-Second Intervals  
with the  
**POST** INTERVAL TIMER



The Post electronic "Interval Timer" permits fractional second timing of any industrial operation. One or more different functions can be controlled by various models.

60 Cycle, line-current, is converted to 120 impulses per second. Desired "action-intervals" can be set in increments as fine as 1/120th of a second, and the timer will automatically time the operation. Controls are easily set... stay in position.

Filling operations, conveyor feeding, etc. are ideally solved by this latest Post development. Write for details.

Electronic Products Division  
Dept. 551

**POST**  
MACHINERY CO.  
Beverly, Mass.

When inquiring check CP 5856

## ENGINEERING AND MAINTENANCE

### Up to eight circuits controlled by small selector switch...

less than four-inch length, two-inch diameter space needed to mount unit

**Uses:** Subminiature rotary selector switch is for use on electronic equipment control boards where space is at a premium. Double-break switches are especially useful on reversing circuit applications where space is limited.

**Features:** Rotary selector switches offer a means of switching as many as eight circuits in one compact assembly. They are available with two to eight switching units and two to eight detent positions, with a 45° angle between detents.

Double-break switches are designed to control two isolated circuits. By use of a snap-action spring, almost simultaneous break and make of both contacts is accomplished, in both normally closed and normally open circuits.

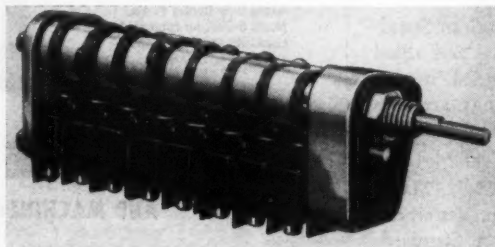


Virtually any switching sequence is possible with rotary selector unit

**Description:** Rotary selector eight-switch assembly requires only 1-17/64" diameter mounting surface and its overall length is less than four inches. Use of ultra small, single-pole, double-throw switching units makes possible a compact switch assembly with almost infinite number of wiring combinations. In the eight-switch assembly, four switches can be wired normally open and seven normally closed.

Switches are available with drilled, solder terminals, or wrap-around turret terminals. They are rated for an inductive load of 3 amp at 30v DC and 10 amp at 125 or 250v AC.

Double-break switches are also small in size, being 1/2 x 1/2 x 1 1/4". Two screw terminals (one normal-



Double-break switches are useful on reversing circuit applications in limited spaces

## Save Time and Money on TOWER PACKINGS



Raschig Ring



Single-Partition Ring



Cross-Partition Ring

• KNOX produces porcelain tower packings from the same composition as is used for high voltage electric porcelains.

• Resists high temperatures, fumes, vapors, corrosion, liquids, alkalis and acids.

• Non-porous — complete vitrification firing 2300°F provides zero porosity.

• Modern production techniques and over 30 years "know-how".

• Wide range of designs.

• Uniform quality.

If you're interested in Better Tower Packings at lower Operating Cost, we'll be glad to send more information, prices and samples on request.

Also Manufacturers Special Porcelain Items for the Chemical Industry — send Drawings or Samples for Quotations.

**Specify KNOX for initial installations as well as replacements**



Berl Saddle



Porcelain Carbony Bung



Porcelain Jet Ring  
Patent Pending



Porcelain Ball

**KNOX**

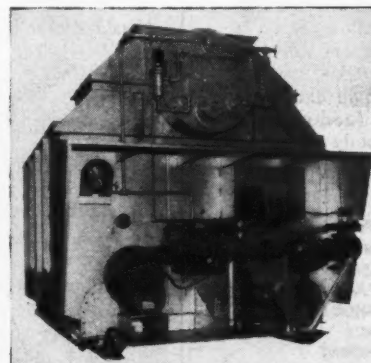
**PORCELAIN CORPORATION**

KNOXVILLE 1, TENNESSEE

When inquiring check CP 5857 opposite last page

for accurately controlled high temperature  
at low pressure:

**UNION** | **PACKAGED DOWTHERM VAPORIZERS**



Piped, wired and entirely assembled before shipment, Union Type MH Packaged Dowtherm Vaporizers are built in capacities from 4,000,000 to 15,000,000 BTU/hr. for use with Dowtherm or other heat transfer media. Their compact, divided tube bank design assures uniform gas flow across the heating surface. With greater heating surface per BTU provided, fluid overheating is prevented. Designed for heating with oil, gas, waste heat or special fuels, MH Vaporizers are installed indoors or out—wherever high temperature, low pressure heat is required in the process industries.

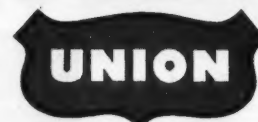
Union also produces a complete line of process heating equipment in capacities from 50,000 to 30,000,000 BTU/hr.

For detailed information without obligation, write.

**UNION IRON WORKS**

1555 Cascade Street

Erie, Pennsylvania



When inquiring check CP 5858 opposite last page

CHEMICAL PROCESSING

ly open and one normally closed) extend from either end of phenolic case. Terminals are plated for soldering for applications in which switch is used without screws. Two .101" diameter holes on a .520" center are provided for mounting switch in a fixed position. Two-circuit double-break switches will switch 10 amp at 125 or 250v AC, and 10 amp at 30v DC, inductive.

(Subminiature rotary selector and two-circuit double-break basic switches are products of Micro Switch, a Division of Minneapolis-Honeywell Regulator Company, Dept. CP, Freeport, Ill. . . . check CP 5859 on handy form opposite last page.)

#### Eliminates manual operation of valves

Valve control which eliminates need for manual operation of valves is described in 21-page catalog. Operational details of units are included.

Cat L-54 is issued by Philadelphia Gear Works, Dept. CP, Erie Avenue and G Street, Philadelphia 34, Pa. Specify CP 5860 opposite last page.

Are you wondering why many of these editorial articles give . . .

#### Manufacturer's Name and Address . . . ?

You doubtless have noted names and addresses of manufacturers at the end of editorial articles in CHEMICAL PROCESSING. Have you wondered, "Is this some sort of advertising?"

It isn't . . . that "source" is there because the editors know that often you want more information, quickly and easily. Of course, such articles are purely editorial material which has been selected by the editors as being worthy of your attention . . . (it is **not** carried with any responsibility to the manufacturer nor does it obligate the manufacturer). This is strictly a service for you . . . the reader.

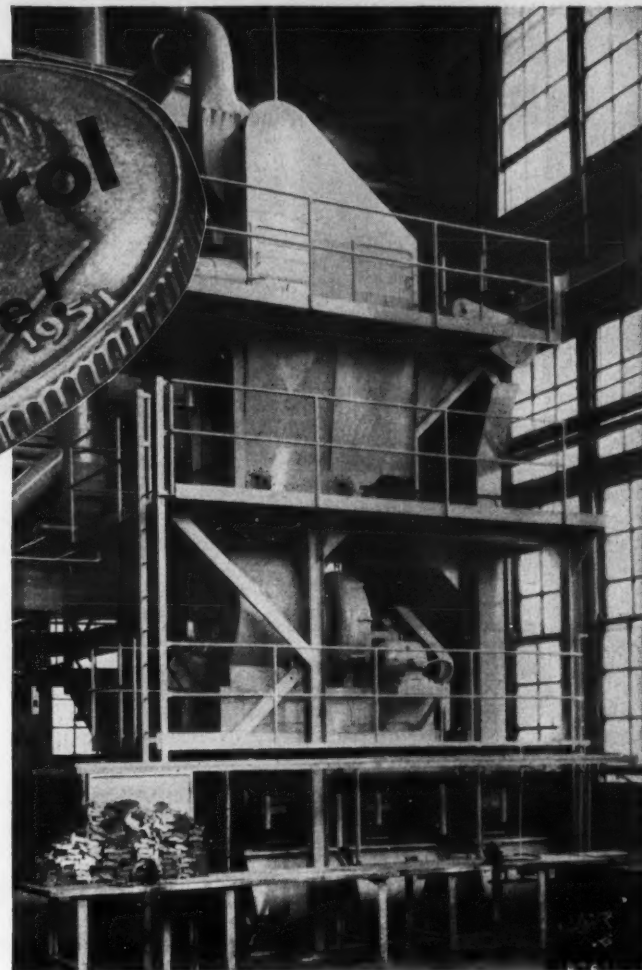
We know that many readers often want more than just the pertinent description and facts . . . so we tell you where and how you can obtain complete details, either by writing direct or using the handy Reader Service slip.

This is one of our extra Reader Services, pioneered in this field by CHEMICAL PROCESSING in 1938.

THE EDITORS



**Two complete ROTO-CLONE  
dust control systems  
occupy only  
66 SQ. FT. of FLOOR SPACE**



**L**ACK of room is no alibi for not providing efficient dust control. Here's a dual ROTO-CLONE\* installation in a large foundry which occupies only 66 sq. ft. of floor space. A Type D of 4500 cfm capacity, located on lower platform, collects snag grinder dust. At top, a Type N of 6000 cfm capacity exhausts abrasive cleaning equipment. Dust and sludge from the two units are discharged through chutes into covered tote boxes at bottom for later disposal.

Every dust collector in AAF's complete line is a

space saver. And, with all this compactness, every unit is a high efficiency collector designed for constant exhaust volume and maintained performance over a wide range of operating conditions.

Remember—there is always room for modern dust control. The right equipment coupled with creative engineering thinking is certain to come up with a practical, economical solution. AAF has both. We'd like to prove it in your plant.

\*ROTO-CLONE is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.



**American Air Filter**  
COMPANY, INC.

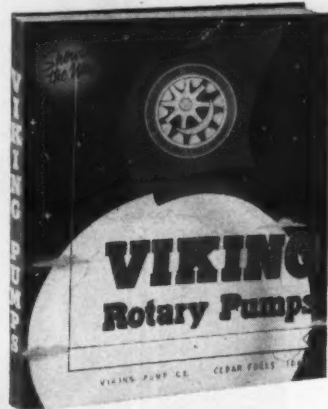
American Air Filter of Canada, Ltd., Montreal, P. Q. • 258 Central Avenue, Louisville 8, Kentucky

When inquiring check CP 5861 opposite last page

Now Latest Information on Viking Pumps!

## NEW CATALOGS

- ☐ B-cc General Purpose Pumps
- ☐ C-cc Heavy Duty Pumps
- ☐ D-cc Underwriter Pumps
- ☐ E-cc Jacketed Pumps
- ☐ F-cc Sanitary Pumps
- ☐ G-cc Oil Industry Pumps
- ☐ H-cc LP-Gas Pumps
- ☐ I-cc Hydraulic Pumps
- ☐ J-cc Special Application Pumps



**FREE**

Just check the catalogs you want. Attach to your letterhead, sign and mail.



**VIKING PUMP COMPANY**

Cedar Falls, Iowa

See our catalog in SWEETS

When inquiring check CP 5862 opposite last page

## EMBECO non-shrink GROUT for setting heavy equipment



now...  
**READY  
TO  
USE**

You add only water to EMBECO PRE-MIXED GROUT to produce:

- Flowable grout that is easily placed yet...
- Non-shrink with full bedplate contact.
- Maintains alignment.
- High compressive and impact-resistant strength.
- Withstands vibration and pounding action.
- Oil and water-resistant.

EMBECO PRE-MIXED GROUT makes possible savings in time, money and labor. Provides uniformly superior results. Recommended by leading machinery and equipment manufacturers. Write for 8-page illustrated booklet on this easy-to-use product.



Creators and Manufacturers

of Products to Improve Concrete and Mortar

**THE MASTER BUILDERS CO.**

CLEVELAND 3, OHIO

Subsidiary of American Marietta Company

TORONTO 15, ONTARIO

When inquiring check CP 5863 opposite last page

## MAINTENANCE

**Safety and aisle lines made fast with light, mobile marker**

**Uses:** In industrial plants for marking safety, aisle, and parking lines.

**Features:** Unit can be operated at walking speed with a minimum of direction from operator.



Marker operates at walking speed with minimum direction from operator

**Description:** Marking machine, called the Florline Upright Model, has operating advantages of heavier power machines while maintaining maneuverability, lightness and mobility of two-wheeled models. It can be adjusted to best operating height for use. A slight lift of handle raises brush to allow machine to make skip lines or be wheeled to other areas.

(Floor marking machine is a product of H. C. Sweet Co., Dept. CP, 12345 Telegraph Road, Detroit 39, Mich. . . or for more information check CP 5864 on handy form opposite last page.)

★ ★ ★  
**"THAT'S INTERESTING"**

### Antiseptic brush bristles

A process which renders nylon and animal brush bristles antiseptic over extended periods has been developed. It involves treating bristles for tooth and hair brushes with an organic mercury solution. In tooth brushes treated and tested, bacteria found no foothold even after 390 minutes of brush use. It is estimated that 300 minutes is equal to average tooth brush life.

## More effective control of many corrosives

assured by specialized  
**Ucilon® Coating Systems**  
developed to overcome  
specific problems

Sixteen systems of Ucilon Protective Coatings have been developed to provide the variety of specialized materials and coating combinations needed for hundreds of specific corrosives.



This Bulletin No. MC-8 gives details. Send for it.

## UCILON Protective Coatings

Trade Mark

One Group of the Many **UNICHROME** COATINGS FOR METALS

UNITED CHROMIUM, INCORPORATED 100 East 42nd Street, New York 17, N. Y.  
Detroit 20, Mich.—Waterbury 20, Conn.—Chicago 4, Ill.—Los Angeles 13, Cal.  
In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 5865 opposite last page

**SPRACO NOZZLES**

Write for NOZZLE CATALOG to  
**SPRAY ENGINEERING CO.**  
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 5866 opposite last page

CHEMICAL PROCESSING

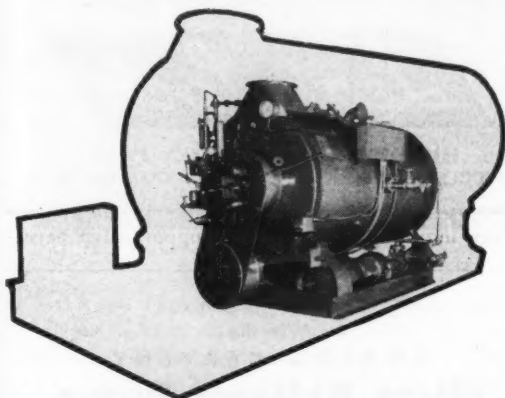
**Only 20% of normal space used when 9'5" long, 250 hp boiler is installed . . .**

unit, designed for 15 to 200 psi, can supply up to 7500 lb steam an hour

**Uses:** Steam generating applications especially where space for installation is limited.

**Features:** This 250 hp boiler is only 9'5" long, 6'0" wide and 6'8" high. Only about 20% the normal space is needed for installation.

Steam generator is designed for 15 to 200 psi pressure. It delivers a maximum guarantee of 7500 pounds of steam per hour. The normal operating capacity is 6250 pounds per hour. Boiler is equipped with a modulating unit that operates from 30 to 100% of capacity.



Steam generator compared in size to standard 250 hp unit (outline)

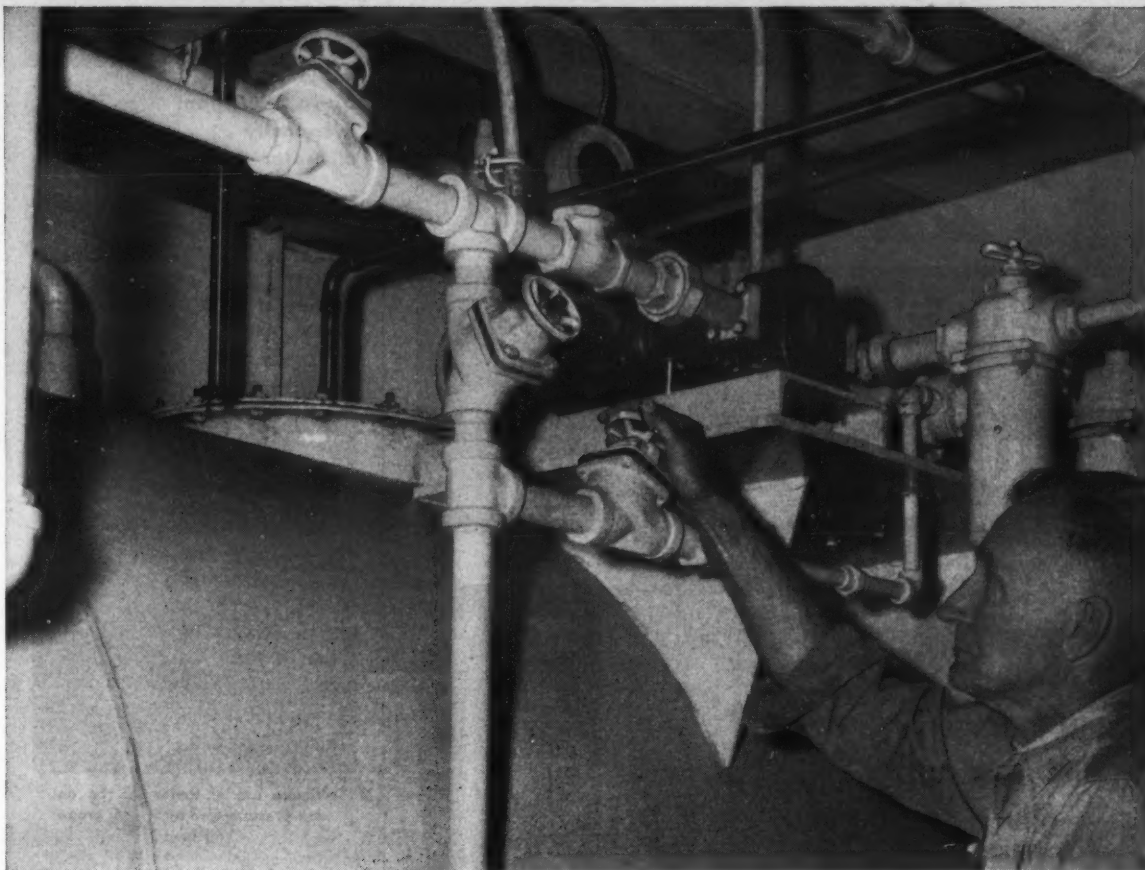
**Description:** Firetube steam units, designated MC250, are available in sizes ranging from 18 to 500 hp. They burn either oil or gas, or oil and gas. Cyclonic Combustion principle coupled with a two pass design is utilized. A revolving spiral vortex of flame in combustion chamber travels at a rate of approximately 290 fps.

(Cyclotherm MC250 is a product of Dept. 31, Cyclotherm Div., US Radiator Corp., Dept. CP, Oswego, N.Y. . . . check CP 5867 opposite last page.)

**Illustrates simple design of sensitive governor**

Construction features, operating characteristics, models, and applications of simply-designed load-sensitive electro-mechanical governor are presented in four-page bulletin.

Bul T-8500, is available from Inet Div., Leach Corp., Dept. CP, 4441 Santa Fe Ave., Los Angeles 58, Calif. Specify CP 5868 opposite last page.



## Light oil meets its master in these CRANE VALVES

**THE CASE HISTORY**—Read how the Johnson & Johnson baby products plant at Cranford, N.J., completely stopped a valve leakage condition that wasted product . . . caused a safety hazard . . . and menaced the plant's high sanitation standards.

Valves formerly used on very light baby oil lines were the source of trouble. Keeping them tight at the stuffing box was next to impossible. Constant servicing of stuffing boxes was necessary, even after repacking every 4 to 8 weeks. Several packings were tried without success while the high maintenance costs and nuisance conditions continued.

Early in 1951 the plant found the solution in Crane No. 1610 Packless Diaphragm Valves. They removed the cause of leakage—immediately stopped its troubles and costs. Almost 4 years later—with no maintenance whatsoever—the Crane packless valves remain absolutely tight; continue giving perfect service. And that goes for all valves added since the first installation.

### Crane No. 1610 Packless Diaphragm Valves

When you have valve problems with hard-to-hold fluids, try Crane Packless diaphragm valves. They eliminate stem leakage and maintenance on air, vacuum, gas, light oil and similar services. Their diaphragm has longer life, yet should it fail, their separate disc prevents escape of line fluid. Available in wide selection of materials and sizes. Ask for folder AD-1942 or see your Crane Representative.



## CRANE CO.

General Offices: 836 S. Michigan Ave., Chicago 5, Illinois  
Branches and Wholesalers Serving All Industrial Areas

**VALVES • FITTINGS • PIPE • PLUMBING • HEATING**

**CRANE'S FIRST CENTURY . . . 1855-1955**

When inquiring check CP 5869 opposite last page

No. 3\* of ...

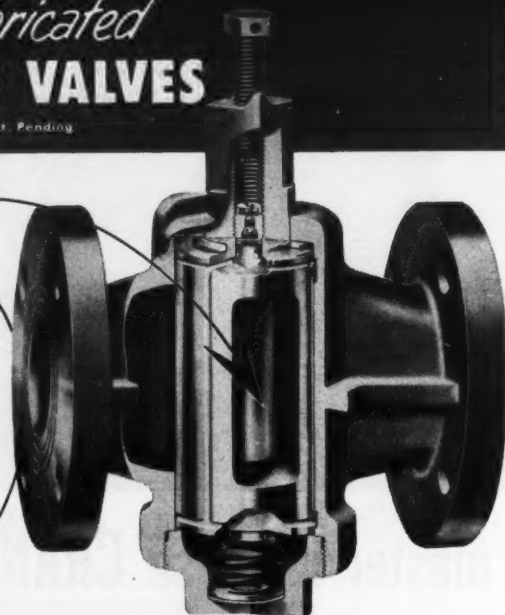
## 12 REASONS WHY YOU SHOULD BUY AND USE *LOW-PRICED*

# HOMESTEAD

*Lubricated*  
**PLUG VALVES**

Pat. Pending

**AVAILABLE  
IN 100%  
PIPE AREA  
AND  
VENTURI  
PATTERNS**



Insist on 100% pipe area **HOMESTEAD LUBRICATED PLUG VALVES** to avoid costly pressure losses. If a slight restriction is unimportant, worthwhile savings can be made by using our Venturi type valve.

Your choice of ports is only **ONE REASON WHY** you should buy and use, *low priced* **HOMESTEAD LUBRICATED PLUG VALVES**.

### HERE ARE ALL TWELVE

1. Reinforced Teflon packing ring.
2. Completely controlled high-pressure lubricant system.
3. 100% pipe area and venturi patterns.
4. No spring torsional stress.
5. No mechanical adjustments.
6. Two lubricants handle most services.
7. Extremely close tolerance between sealing surfaces.
8. Triple head-seal with Lubricant and Teflon packing ring.
9. Plug floated on Teflon surfaces.
10. Leak-proof, double-ball-and-lubricant-sealed check valve.
11. Full-threaded screw assures clean lubricant.
12. Extruded lubricant shows a full protecting system.

**FOR CATALOG AND COMPLETE DETAILS MAIL COUPON TODAY**

Without obligation, send Reference Book 39—Section 5 on **HOMESTEAD LUBRICATED PLUG VALVES**.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**HOMESTEAD** VALVE MANUFACTURING COMPANY

Serving Since 1892

P. O. BOX 140

CORAOPOLIS, PA.

When inquiring check CP 5870 opposite last page

## MAINTENANCE

**Up to 2000 gpm  
is capacity  
of meter**

Described as the largest meter in the industry, unit recently added to company's line has a rated capacity of 2000 gpm under a working pressure of 1200 psi. Principal use of the meter, designated Model



Primary use of meter will be on high-pressure product and crude oil lines

M-200, would be on high-pressure product and crude oil lines. Weight of complete meter is 6275 lb, although inner metering unit weighs only 800 lb.

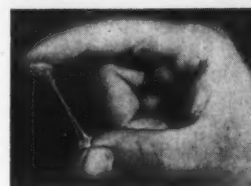
(High-pressure Meter is a product of Meter Div., A. O. Smith Corp., Dept. CP, Box 584, Milwaukee 1, Wisc. . . or for more information check CP 5871 on handy form opposite last page.)

### Synthetic fiber spinnerettes

Spinnerettes — precision instruments upon which an entire synthetic fiber manufacturing process depends — are described in eight-page illustrated booklet. Manufacturing process for spinnerettes and the strict scientific control under which they are made are emphasized.

"Spinnerettes for Synthetic Fibres" is issued by Baker & Co., Inc., Dept. CP, 113 Astor St., Newark 5, N.J. Specify CP 5872 opposite last page.

## WHAT PIPE JOINT COMPOUND WOULD YOU SPECIFY TO HOLD...



Tacky enough to hold on to any type of surface

**PERCHLORETHYLENE,  
TOLUENE,  
"FREONS"®,  
ACETIC  
ANHYDRIDE?**

Leak Lock joint compound, with five years use in the chemical, refrigeration and aircraft industries, may be the answer to your "unsolvable" leaking joint problems.

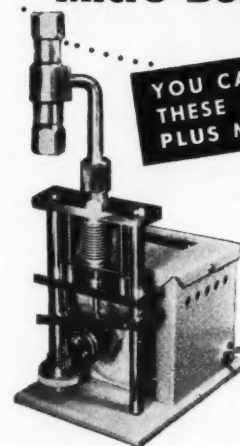
Leak Lock has other unusual chemical properties . . . great adhesion and flexibility. It will resist almost everything except lower alcohols and caustic solutions. Ask us about your joint compound problems and request a sample.

*Leak Lock*

**HIGHSIDE CHEMICALS COMPANY**  
16 COLFAX AVENUE, CLIFTON, N. J.

When inquiring check CP 5873 opposite last page

## With the CORSON-CERVENY Micro-Bellows Pump



**YOU CAN HANDLE ALL  
THESE MATERIALS —  
PLUS MANY MORE:**

Acetaldehyde  
Acetic Acid  
Acetone  
Aniline  
Benzaldehyde  
Benzene  
Ethyl Benzene  
Carbon Disulfide  
Carbon Tetrachloride  
Cyclohexane  
Dioxane  
Ethanol  
Formalin  
Isopropyl Alcohol  
Methanol  
Pyridine  
Toluene  
Water

We have a booklet that gives all construction, operation and application details of the Corson-Cerveny Micro-Bellows Pump. Write for your copy.

**RESEARCH APPLIANCE COMPANY**

143 Cemetery Lane, Pittsburgh 9, Pa.

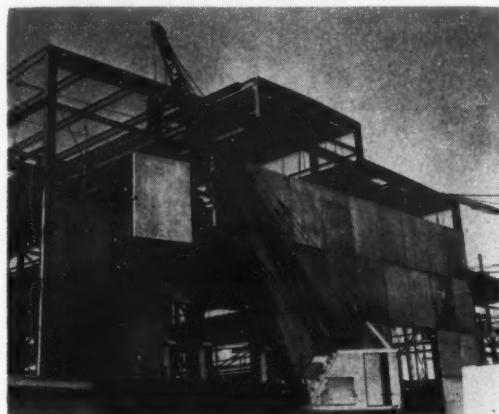
When inquiring check CP 5874 opposite last page

CHEMICAL PROCESSING

**Industrial building walls  
are precast, constructed  
like sandwiches . . .**

insulation-filled panels are quickly installed by crane and nine-man crew at UCC

Both time and money were saved in the erection of precast concrete wall panels used in the construction of the recently completed plant of UCC's Electro Metallurgical division at Ashtabula, Ohio.



Four precast panels can be installed in an hour

Panels are like concrete sandwiches. Each consists of two layers of wire-reinforced concrete around a filling of insulation material — in this case, Fiberglass. Panels are five to eight inches thick and come exterior finish gives them the appearance of cut in many basic sizes from 8 x 8' up.

A nine-man crew, using a mobile crane, can install four 8 x 10 foot panels in an hour. Approximately 140,000 sq ft of panels were supplied for the Electromet plant at Ashtabula. They are used in the construction of four buildings — a 70' high furnace building, a machine shop, and service and locker buildings.

It is said that costs are cut anywhere from 25 to 33% in comparison with concrete or brick masonry.

(Precast concrete wall panels are a product of The Marietta Concrete Corp., Dept. CP, 1949 Register Ave., Marietta, Ohio . . . or for more information check CP 5875 on handy form opposite last page.)

**Power transmission products  
detailed in eight pages**

Line of company's mechanical power transmission products is described in eight-page bulletin.

Cat B20-53 is issued by Morse Chain Company, Dept. CP, 7601 Central Ave., Detroit 10, Mich. Specify CP 5876 opposite last page.

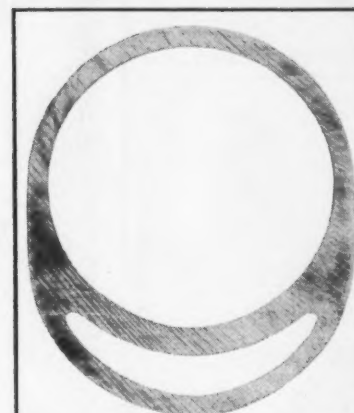
*Alcoa's New  
Steam Traced Pipe  
saves*

30% of labor costs  
Reduces material costs  
Reduces insulation costs  
over conventional  
steam-jacketed lines

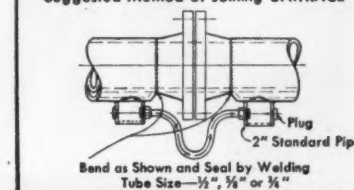
Here's a totally new product for users of steam-traced piping. ALCOA's UNITRACE® eliminates the cost of external steam jackets or steam-tracer tubes because the steam line is an integral part of the aluminum pipe!

Because of the natural corrosion resistance of aluminum, UNITRACE is well suited for handling naval stores, molten sulphur, ammonium nitrate solutions, glacial acetic acid, fatty acids, tar, pitch and similar products normally requiring steam tracing.

UNITRACE provides greatly improved heat transfer properties . . . lends itself readily to shop fabrication of standard lengths . . . can be formed easily with pipe bending tools. Pre-formed insulation will fit UNITRACE, but improved efficiency makes thermal insulation unnecessary in many cases.



Suggested Method of Joining UNITRACE



UNITRACE is available in 2 inch standard schedule 40 pipe size.

For complete information, write for free booklet. Use the coupon.

® Registered Trademark,  
Aluminum Company of America

**ALCOA**   
**ALUMINUM**  
ALUMINUM COMPANY OF AMERICA

ALUMINUM COMPANY OF AMERICA  
902-C Alcoa Building, Pittsburgh 19, Pa.

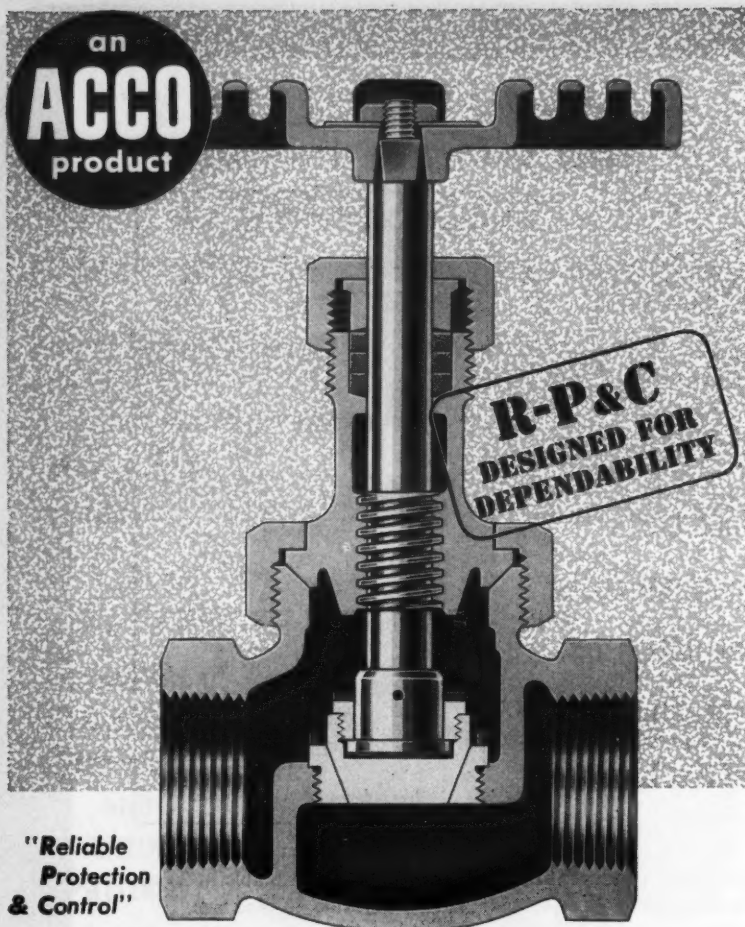
Please send me your free booklet,  
UNITRACE. We use steam-traced piping for

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 5877 opposite last page



## New R-P&C Bronze Globe Valve

- STAINLESS STEEL SEAT AND DISC (500 BRINELL)
- FULL-PLUG FOR CLOSER REGULATION, LONGER LIFE

R-P&C's new Fig. 427-DP bronze globe valve is recommended for steam, water, oil and gas service where control or regulation of flow is required. Its 500 Brinell stainless steel seat and disc resist wire-drawing—make it particularly suitable for continuous throttling and other severe applications.

• The Fig. 427-DP is packed with the quality features that users expect from R-P&C. For example, the union bonnet for added strength and convenience, and a disc and seat ring construction which permits regrinding without removing the valve from the line. The full-plug construction, with its exceptional wide seating surface, gives closer control, longer life.

• The Fig. 427-DP is rated for 300 lbs. Steam—1000 lbs. owg in sizes  $\frac{1}{4}$ " to 2", and 600 owg in sizes  $2\frac{1}{2}$ " and 3". Also supplied as an angle valve. Precisely designed, it is a fitting addition to R-P&C's complete line of bronze valves—gates, globes, angles and checks, in pressure classes from 125 to 300 lbs. See your R-P&C Distributor or write for catalog.

ACCO



**R-P&C Valve Division  
AMERICAN CHAIN & CABLE**

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit,  
Houston, New York, Philadelphia, Pittsburgh, San Francisco,  
Bridgeport, Conn.

**R-P&C  
valves**

When inquiring check CP 5878 opposite last page

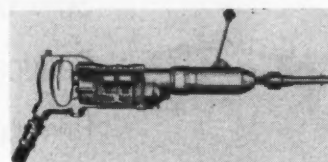
## MAINTENANCE

**Accurate cutting tool  
removes leaky tubes  
quickly . . .**

air-operated unit cuts from  
inside

**Uses:** Removal of damaged or  
leaky tubes from condensers and  
heat exchangers.

**Features:** Powered by an air-  
driven motor, unit can be inserted  
in tube and quickly cuts tube be-  
hind tube sheet. Double-action cut-  
ting tool with two cutters is self-  
centering.



Cutter can be used on tubes  
from  $\frac{3}{8}$  to 1" OD

**Description:** Internal tube cutter  
will cut steel and non-ferrous con-  
denser tube from  $\frac{3}{8}$  to 1" OD.  
It can be used through tube sheet  
thicknesses of 1 to 4". Ball bearing  
collar, which prevents friction, is  
adjustable for various tube sheet  
thicknesses.

(Tube Cutter is a product of The  
Airetool Mfg. Co., Dept. CP, 304  
S. Center St., Springfield, Ohio  
. . . or for more information check  
CP 5879 opposite last page.)

## Boiler baffle design detail

Bulletin of 20 pages, designed  
to show modern boiler baf-  
fling, describes materials used  
and methods of construction,  
plus engineering involved.  
Photos and drawings illustrate  
various installations involving  
several makes and kinds of  
boilers, furnaces, and methods  
of firing.

Bul BW 54 is issued by The  
Engineer Co., Dept. CP, 75  
West St., New York 6, N.Y.  
When inquiring specify CP  
5880 opposite last page.

safe, small  
equipment  
investment  
pays big  
dividends

speed work  
cut congestion  
provide for emergency  
with **WHEELER**  
SOUND POWERED  
*Electric*

## TELEPHONES AND INTERCOM SYSTEMS

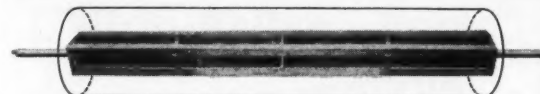
There's a place for these unique  
communication instruments in every  
plant, office, commercial establish-  
ment. NO BATTERIES . . . NO OUT-  
SIDE POWER . . . ALWAYS READY.  
Connect frequently called locations . . .  
ideal for emergency standby (no main-  
tenance, no deterioration). Wide range  
of handsets, pair phones, intercom  
systems, executive desk sets and port-  
able special-purpose equipment. Low  
in cost. Get the facts. Write today.



**the WHEELER INSULATED WIRE CO., INC.**  
Division of The Sperry Corporation  
1112 East Aurora Street  
Waterbury 20, Connecticut

When inquiring check CP 5881 opposite last page

## TRENT "FOLDED-AND-FORMED" HEATING UNITS THE ANSWER TO ROLLER HEATING PROBLEMS



When you're faced with the problem of drying paper, heating  
wax, glue or asphalt on rollers, you'll find your solution through  
the faster, higher, more uniform radiant heat furnished only by  
Trent "Folded-and-Formed" Roller Heating Units.

## HERE'S WHY—

Trent "Folded-and-Formed" exposed ribbon type  
resistor heating elements radiate controlled, electrical heat from  
a special rack inside the roller. This compact, uniquely designed  
element assembly remains stationary while the roller revolves  
about it insuring rapid, uniform temperature along the surface of  
a roll of any length. Roller diameters can vary from 6" to 60".

## Drying • Curing • Embossing • Evaporating

are accomplished faster, more effectively, and with  
greater economy through the performance  
of Trent "Folded-and-Formed" heating  
elements. They are constructed to assure  
maximum rigidity for long life and  
easy maintenance even under hardest  
use. They pay off in—

- GREATER PRODUCTION
- HIGHER QUALITY
- LOWER COST

**Trent Engineering Service**  
An experienced Trent engineer  
will gladly survey your require-  
ments to help you determine  
the most efficient, economical  
approach to your heating prob-  
lems. In the meantime, write  
for the new Trent "Folded-and-  
Formed" Heating Element Booklet.



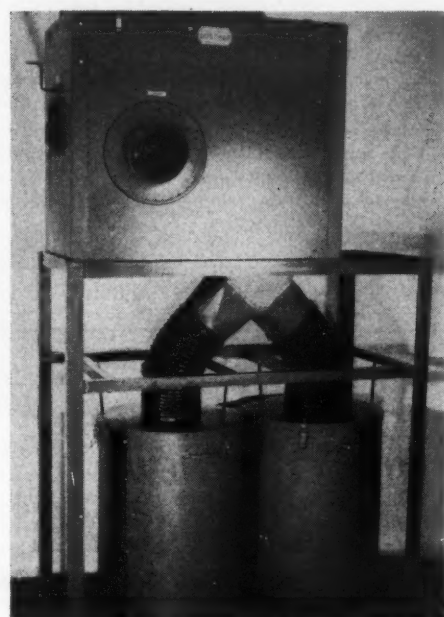
When inquiring check CP 5882 opposite last page

CHEMICAL PROCESSING

### Recommends applications for industrial greases

Service recommendations for company's line of industrial lubricants (containing graphite) are presented in four-page data sheet. Services discussed include bearing, plunger, cable and open gear, enclosed or pan dipping gear.

"Service Recommendations for Industrial Lubricants" is available from Gredag, Inc., Dept. CP, 253-55 Second St., PO Box 898, Niagara Falls, N.Y. Specify CP 5883 opposite last page.



More efficient and easily maintained dust collecting unit has resulted from design changes made in company's Dustkop Model 11w50. Overall height of unit has been reduced by about 10" by elimination of standard dust bin. Filtered dust, shavings, chips, or lint is allowed to drop directly into cans.

Two roller cans plus diversion "Y" have also been redesigned to permit greater capacity and easier maintenance. All metal, flexible "Y" provides cans with better, more permanent seal, permitting dust to flow more freely and settle faster. Lid and "Y" connections are self-supporting during operations.

(Dust collector is a product of Agat Mfg. Co., Dept. CP, Adrian, Mich. . . or for more information check 5884 opposite last page.)

## A revolutionary new principle in Coolers . . .

# THE holo-flite\* (HOLLOW-FLITE) PROCESSOR

Backed by the same well-known organization that pioneered COTTRELL Precipitators, MULTICLONE Collectors and other leading products, the HOLO-FLITE Processor represents a far-reaching advancement in the science of heat-exchanger design. Widely adaptable to various types of cooling and similar applications in industrial processing operations, the HOLO-FLITE handles powdered or granular solids, moist pastes or slurries with equal facility. Moreover, it requires as little as 1/5th the space of other heat exchangers . . . causes no dust, therefore requires no costly or complicated auxiliary recovery equipment . . . and maintains its uniformly high efficiency under modern continuous-flow operations (no stop-and-go "batching" operations are necessary).



### Unique Simplicity

Basically, the HOLO-FLITE consists of two or more hollow intermeshing conveyor screws that slowly rotate in a trough or tube. The cooling agent circulates through the hollow flights and shafts of the conveyor screws while the product itself "flows" in the trough where it is constantly rotated into, around, over and under the moving heat-exchange surfaces. The continuous mixing, turning, folding action causes a constant change of contact with the heat-exchange surfaces and results in a high rate of heat transfer. Yet the action is so gentle that there is no dusting and little, if any, abrasion of crystalline particles.

### Unlimited Capacity

HOLO-FLITE Processors can be readily adapted to virtually any capacity requirement and are in daily operation on such varied products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods, and many other products. Cooled products can be packaged directly from the HOLO-FLITE discharge, saving time, space and additional handling.

Be sure to investigate HOLO-FLITE savings before you install heat-exchange equipment. To insure maximum operating efficiency at low overall cost, each installation is individually engineered to the job using basic stock-size elements. Contact the nearest Western Precipitation office for further details on the revolutionary HOLO-FLITE Processor—or write direct!



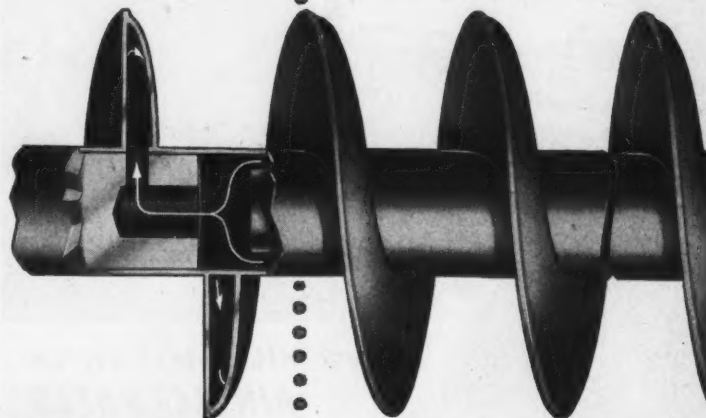
FREE! New 8 Page Bulletin describing HOLO-FLITE features and applications will gladly be sent on request!

\*Reg. T.M.

► Handles Pastes, Sludges or Solids!

► Up to 80% Saving in Space!

► Permits Continuous, High Efficiency Operation!



### A FEW OF MANY HOLO-FLITE ADVANTAGES

**WIDE ADAPTABILITY:** HOLO-FLITE handles fine-grained, crystalline or powdered solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, cooled or ambient water, or other fluids to provide a wide range of processing temperatures.

**SPACE-SAVING COMPACTNESS:** Because of its large active heat-transfer surface per cubic foot of space required, the HOLO-FLITE requires only a minimum of space—is 5 to 6 times as compact as other equipment of comparable capacity!

**LOW POWER REQUIREMENTS:** HOLO-FLITE conveyor screws rotate slowly—usually only 1 to 12 r.p.m. Further, multiple tiers can be driven by one motor, assuring low power consumption.

**INSTALLATION FLEXIBILITY:** The basic HOLO-FLITE unit is two intermeshing screws in a single trough, but four or six screws per trough can also be installed. Moreover, any number of troughs can be "tiered" on top of one another—trough lengths can be varied from 8 to 20 ft.—screw diameters can be varied from 7" to 16"—to provide virtually any desired capacity in a minimum of space!

Write for full details on the many savings the HOLO-FLITE Processor can bring to your particular applications.

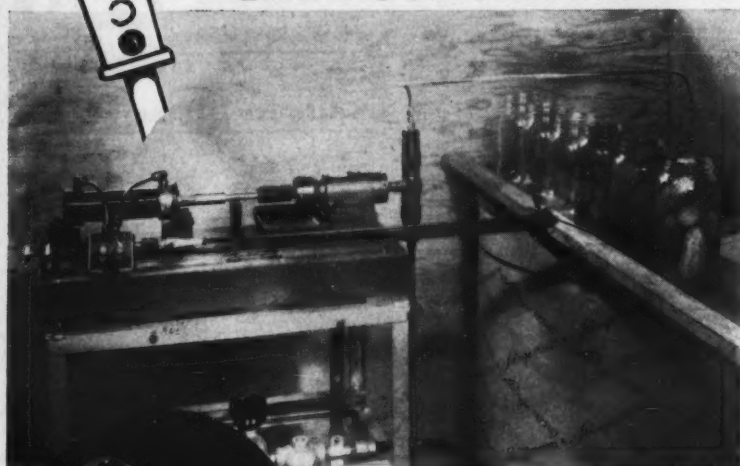
# WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR  
COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA  
CHRYSLER BLDG., NEW YORK 17 • 1 N. LaSALLE ST. BLDG., CHICAGO 2  
3252 PEACHTREE RD. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4  
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

When inquiring check CP 5885 opposite last page

Here's how to get  
**QUICK STARTS  
and POSITIVE STOPS**



**New HILLS-McCANN  
AIR ACTUATED  
Metering and  
Proportioning  
Pumps**

Have you a problem involving continuous metering of small volume flows? The new Hills-McCanna air actuated pumps can solve these problems in many cases where conventional pumps are not satisfactory . . . because they have an air cylinder drive. With them you can start fast and accurately and stop immediately — at high or low speeds.

In the photo above a "UP" type pump is used as a "pickle pump" — adding just the right amount of brine to pickle jars. Other uses range from the injection of petroleum additives to putting ink in fountain pens. In all these services, the "UP" is dependable and accurate and may be used with a wide variety of controls.

Hills-McCanna air actuated pumps are available in capacities of 0.1 gph. to 200 gph., with adjustable stroke lengths for positive volume control . . . all are built to the same high engineering standards as Hills-McCanna electrically driven pumps.

Write for Bulletin UP-55 — HILLS-McCANN CO., 2370 W. Nelson St., Chicago 18, Illinois.

**DESIGN DETAILS**

- External, interchangeable check valves
- Interchangeable barrel and housing
- Unitized construction, common base
- Positive stroke adjustment
- Trouble-free operation

**HILLS-McCANN**

*metering and proportioning pumps*

Also Manufacturers of:  
**SAUNDERS TYPE DIAPHRAGM VALVES  
FORCE FEED LUBRICATORS • MAGNESIUM SAND ALLOY CASTINGS**

When inquiring check CP 5886 opposite last page

**MAINTENANCE**

**Paint stripping operation  
can be included in cycle  
of production line . . .**

fast action of stripper permits  
refinishing without delay

**Uses:** Removal of most baked  
or air-dried enamels, lacquers, syn-  
thetics, paints, varnishes, wrinkled,  
hammered or specialty finishes.

**Features:** Speed with which  
paint stripper works makes it pos-  
sible to include stripping operation  
in regular production line cycles if  
desired. Product is non-flammable  
and only mildly toxic.

**Description:** Instant Stripper is  
a fast-acting paint stripper of the  
methylene chloride type. It may  
be applied by dip, flow-coat, brush  
or spray.

(Paint Stripper is a product of V.  
J. Dolan & Co., Inc., Dept. CP,  
1830-32 N. Laramie Ave., Chicago  
39, Ill. . . . or for more informa-  
tion check CP 5887 on handy  
form opposite last page.)

**Low capacity steam trap  
designed for light  
condensate loads . . .**

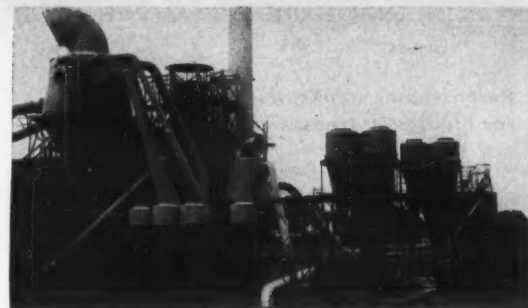
all-stainless unit operates at  
pressures to 400 psi

**Uses:** For steam trap applica-  
tions, unit is designed with low  
capacity to handle light conden-  
sate loads.

**Features:** Steam trap is com-  
pact. Body and all working parts  
are made of stainless steel.

**Description:** Impulse steam  
trap is 1/2"-size. It will not freeze  
or air bind on steam tracer line  
service. Unit also gives excellent  
performance on other light load  
applications. It is good for all  
pressures to 400 psi.

("20-A" impulse steam traps are  
products of Yarnall-Waring Co.,  
Dept. CP, 100 Mermaid Ave.,  
Philadelphia 18, Pa. . . . or for  
more information check CP 5888  
on the convenient Reader Service  
slip which is located opposite last  
page.)



Foreground, DUSTMASTERS. Background, old collectors being removed.

**Banister DUSTMASTERS solve  
large manufacturer's dust problem!**

In order to eliminate a dust nuisance and also collect usable  
product, the company modernized its dust collecting system with  
Banister DUSTMASTERS. Before replacing the old system, ex-  
tensive tests were made to determine which equipment would  
do the job best at a moderate cost.

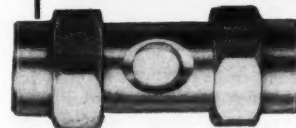
DUSTMASTERS were selected on the basis of the findings.  
They have greatly improved product recovery, eliminated a  
public nuisance, and solved long standing maintenance problems.

Our engineering and manufacturing facilities are at your  
service. Your inquiries will receive prompt attention. Send for  
Catalog and material showing how DUSTMASTER Systems  
solved many so-called impossible dust collecting problems.

A. W. Banister Company, 21 Charles St., Cambridge, Mass.

When inquiring check CP 5889 opposite last page

**SEE INSIDE  
YOUR FLUID LINES  
WITH THE NEW  
LIQUID EYE®  
INDICATOR  
3000 SERIES**



- High pressure Pyrex sight glass.
- Pressure-sealed Neoprene sealing rings at both ends.
- Withstands operating pressures of 600 psi. and temperatures of 300° F. continuously.
- Unrestricted full line flow.
- Ruggedly constructed of cadmium plated steel.
- Ideal for wide variety of applications.
- Available in 3/4", 1" and 1-1/4" i.p.s.

Same design in the 5000 Series with extended tube  
ends for 3/4" thru 1-1/4" copper tube sizes. All Liquid  
Eye Indicators carefully tested to insure trouble-free  
performance.

Send for Catalog D-55 covering the complete Allin line.

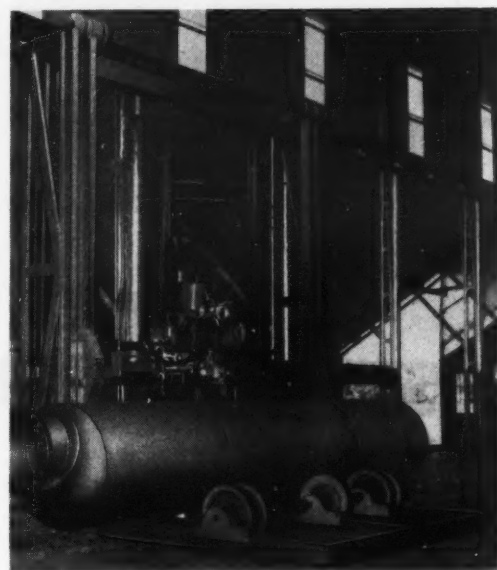
**Allin MANUFACTURING COMPANY**  
1153 W. Grand Ave., Chicago 22, Ill.

When inquiring check CP 5890 opposite last page

CHEMICAL PROCESSING

### Welds vessel 120' long and 16' in diameter under own power

Welding machine capable of handling pressure vessels up to 120' long by 16' in diameter and weighing 100,000 lb has been designed and constructed. Unit is all motor-powered and works by remote control from a front panel located next to operator. Tank is rotated for welds around circumference.



Electric power controls move welding machine quickly

Machine itself, with two welding heads, travels under its own power on a track that is 120' long. Under usual system, it is necessary to move tank which is a time-consuming job, but this machine can be moved by electric power controls in a short time.

(Welding machine is a development of Master Tank and Welding, Dept. CP, 1612 Singleton Blvd., Dallas, Tex. . . . check CP 5891 opposite last page.)

### Water filter designed, built for paper industry

Designed and built specifically for the pulp and paper industry, cut tooth segment model, rotary, self-cleaning gravity-type water filter is described in eight-page bulletin. Operation data and specifications, drawings and photographs of the unit and installations are also presented.

Bulletin on cut tooth segment model water filter is available from Green Bay Foundry and Machine Works, Dept. CP, 41 S. Broadway, Green Bay, Wis. Specify CP 5892 opposite last page.

### COOPER ALLOY

## CORPORATION BRIEFS

• Edited by GEORGE BLACK

### IT COULDN'T BE CAST... BUT IT WAS

You'll be hearing a lot of talk about the jet engine support which foundries had tried to cast in green sand, dry sand, core mold and lost wax. They said it couldn't be cast . . . but they didn't count on that COOPER ALLOY advanced know-how which has made the difference in so many cases. It's now a regular production item in our Foundry Products Division . . . in spite of the fact that each piece is custom cast. Shell molding plus experience and the will to tackle the tough ones, did the trick. If you haven't reserved your set of Advanced Know-How case histories which are soon to be published—there's still time. A note on your company letterhead is all you need.



### VALVES IN PAPER AND PULP

Chief Engineer of Cooper Alloy's Valve and Fitting Division, Perc Shaffer, recently delivered one of the most comprehensive lectures on the subject of stainless steel valves in the pulp and paper industry. It was printed in toto in the Pulp and Paper Magazine of Canada, and is now available in reprint form from our technical librarian.



### VANTON PUMP MOVES

Vanton Pump & Equipment Corp. has announced the removal of its executive and sales offices from the Empire State Building in New York to the plant location at Sweetland Avenue, Hillside, N.J. The move is the result of increased design and production activity which demands closer liaison between operating and management levels. We anticipate faster action on design changes to increase the versatility and usefulness of this unique pump without a stuffing box. The first such change, involving the shift of bearings to the exterior of the housing, has just been completed. Details on request!

**COOPER ALLOY**  
CORPORATION • HILLSIDE, N.J.

# 3 good reasons for buying COOPER ALLOY stainless steel FITTINGS



- **AVAILABILITY.** Our network of stocking distributors with warehouses and branches in every major industrial city is backed up by our own extensive stocks in Hillside, New Jersey and Oakland, California to insure delivery when you need it.
- **QUALITY.** As the world's largest and most experienced producer of stainless steel fittings, with the most complete production and inspection facilities, COOPER ALLOY sets the quality standard for the entire industry.
- **COMPLETE LINE.** Whatever your needs—whether for screwed, flanged, welding or Quikupl fittings, you will find what you're looking for in the COOPER ALLOY line.



**SCREWED.** All pipe threads on COOPER ALLOY stainless steel fittings are checked to American Standard Tapered pipe thread gauges, and the use of special tools and equipment assures full threads, accurately gauged and perfectly aligned in all planes.



**FLANGED.** General dimensions of COOPER ALLOY stainless steel flanged fittings conform to standards set by the American Standards Association for steel flanged fittings . . . or to Manufacturer's Standardization Society specifications for corrosion resistant flanged fittings.



**WELDING.** COOPER ALLOY stainless steel welding fittings are manufactured in accordance with ASA standards where applicable. They are made of forged or rolled stainless steel; all fittings are of uniform wall thickness and the ends, where wall thickness are greater than .083", are accurately machine tool cut and beveled.

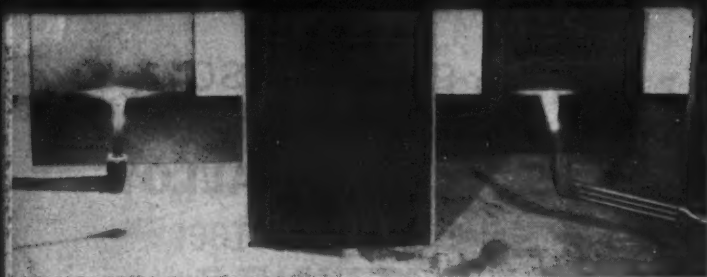


**QUIKUPL.** These patented stainless steel fittings are designed for quick assembly without threading, welding or flaring. They cut installation or disassembly costs to a minimum, and are ideal for permanent or temporary use.

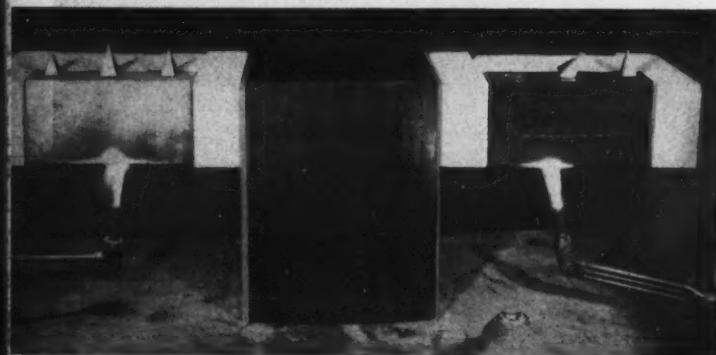
Write today for copy of Fitting Catalog 52F

**COOPER ALLOY**  
CORPORATION • HILLSIDE, N.J.  
Valve and Fitting Division

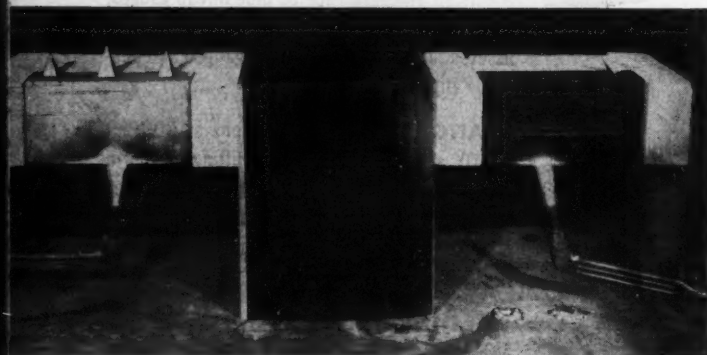
When inquiring check CP 5893 opposite last page



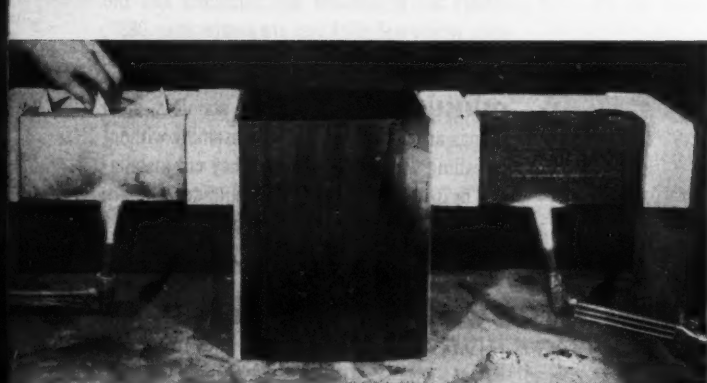
- 1** Which lead pyramids will melt first? Those on the fireclay brick (left), or those on the CARBOFRAX brick?



- 2** In minutes, heat passes through the CARBOFRAX brick... melts the first sinker... now melts the second.



- 3** Here, the third sinker melts... despite angle of the torch.



- 4** Minutes later, the sinkers on the fireclay brick are still cool enough to touch.

# HOW TO MOVE MORE HEAT FASTER...

Here is visual proof of how much faster you can transmit heat through a CARBOFRAX® silicon carbide refractory than through fireclay. By test, 11 to 12 times faster...or about the same rate of heat transfer you get with chrome nickel steel.

When you move heat this fast...

...you save time. You reach operating temperatures faster. And you can quickly shift furnaces and process equipment from one temperature level to another.

...you get better results. This kind of heat conductivity gives you better heat distribution...closer quality control...increased production.

...you cut fuel costs. It takes less fuel to reach operating temperature...less fuel to stay there.

...you can also dissipate heat more rapidly. This is why CARBOFRAX refractories are used for set kettles, arc shields, stills and similar applications.

**Test also proves CARBOFRAX refractories resist intense heat!**

The torch blasted a 1½" hole into the fireclay —yet it had no effect on the CARBOFRAX brick. A striking example of the latter's heat resistance and long-wearing qualities.

For more information write or phone us for your free copy of "Super Refractories." Address Dept. S35, Refractories Division, The Carborundum Company, Perth Amboy, N. J.

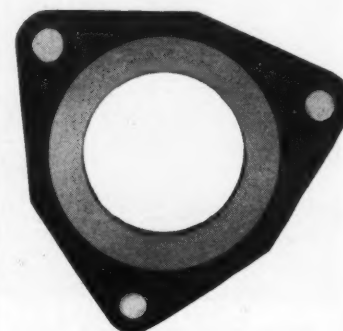
**CARBORUNDUM**  
Registered Trade Mark

## MAINTENANCE

### Danger of rupture ended by gasket design using Teflon

**Uses:** Recommended for service in glass-lined, porcelain, and glass equipment, including reactor kettles and pipes, distillation columns and nozzles.

**Features:** Gasket construction eliminates flow restriction and turbulence in line, as well as danger of gasket rupture at high temperature due to entrapped air between insert and envelope. Envelope is made of chemically inert Teflon, which adapts gasket to corrosive services at varied temperature conditions from -100 to +482°F, depending on insert material.



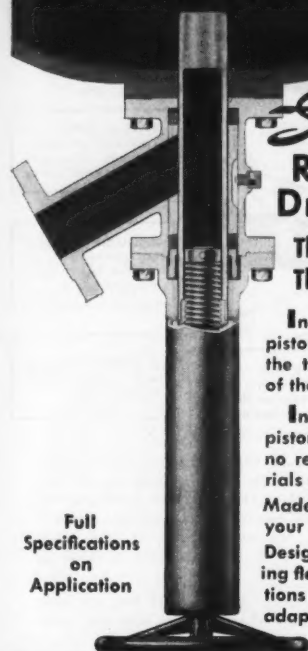
Gasket is corrosion-resistant, withstands wide range of temperatures

**Description:** Inner periphery of gasket is of "channel" construction, so designed that it does not extend beyond ID of pipe to cause a throttling action. Construction also assures full contact with pipe flanges. In addition, design allows insert to extend to full depth of gasket envelope thereby eliminating air space.

(FreeFlow rupture-proof Teflon gasket is a product of Crane Packing Co., Dept. CPC, 1800 Cuyler Ave., Chicago 13, Ill. . . . check CP 5894 on handy form opposite last page.)

For more information on product at left, specify CP 5895 . . . see information request blank opposite last page.

**NO RODDING NECESSARY!**



Full  
Specifications  
on  
Application

## Strahman RAM TYPE Drain Valves

**The Only Drain Valve  
That Cannot Clog Up!**

In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels, adaptor pads are available.

**STRAHMAN VALVES, INC.,** 16 HUDSON STREET  
NEW YORK 13, U.S.A.

When inquiring check CP 5896 opposite last page

## Pump "DIRECT FROM DRUMS"

Graco's air-operated Fast-Flo pump is the low cost way to pump fluids direct from drums to points of use or storage. It can pump an unbelievable variety of liquids. Hundreds of messy, labor consuming jobs can be done clean and quick with Fast-Flo. The heart of the pump is its double acting piston which pumps on both the up and down stroke for continuous volume delivery. It can move SAE 20 fluids at an 18 GPM rate when 150 lbs. air pressure is applied to the air motor... and the pump operates at pressures as low as 35 PSI.

Fast-Flo screws into drum bung openings or clamps on side of open-head drums. Its light weight (13.5 lbs.) makes it easy to move and install in just a few seconds.

**GRAY COMPANY, INC.**  
Engineers and Manufacturers  
32 Graco Square, Minneapolis 13, Minnesota



This 24 page book includes a performance graph showing viscosity ranges of fluids Fast-Flo handles. Write us for your free copy today.

**GRACO** *Fast-Flo*  
**DRUM PUMP**

Regional Offices: New York, Philadelphia, Detroit, Atlanta, Chicago, San Francisco

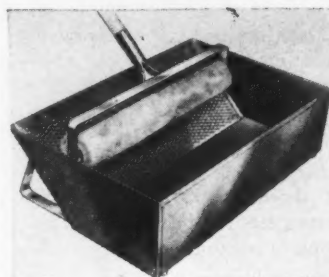
When inquiring check CP 5897 opposite last page

MARCH, 1955

## MAINTENANCE

**For large area painting,  
5-gal container moves  
easily, won't tip**

Floor model paint container, designed for large area work, has heavy bar aluminum runners which allow it to slide easily on floor without danger of tipping. Non-slip roller-ramp is designed to deposit right amount of paint, evenly



distributed, on paint roller. Rust-proof heavy gage galvanized steel and reinforced leak-proof corners insure long life of container. Rectangular-shaped container holds up to 5 gal of paint. It may be used with 14 and 18" rollers as illustrated.

(Model #18-RP "Rol-A-Pot" paint container is a product of The American Products Co., Dept. CP, 3308 Edson Ave., New York 69, N.Y. . . . check CP 5898 opposite last page.)

**No tubes, moving parts  
in voltage regulator**

Detailed specifications on construction, installation and operating characteristics of all-static voltage regulator for 400 cy AC machines are presented in four-page bulletin. Units described have no tubes or moving parts. Included in bulletin are photos of oscillograms showing voltage recovery and stability, output voltage wave form.

Bul T-8400 is issued by Inet Div., Leach Corp., Dept. CP, 4441 Santa Fe Ave., Los Angeles 58, Calif. Specify CP 5899 opposite last page.

## WHAT'S THE PRICE OF THIS AGITATOR?



There are three "price tags" that add extra value to the purchase price of a Nettco Agitator. These are:

**The engineering "price tag"** — your assurance the Nettco drive is the right size, the right speed, the right horsepower, the right shaft diameter — backed by Nettco's over 50 years of serving the agitation needs of industry.

**The operating "price tag"** — your assurance the Nettco unit is engineered for low power consumption and high productivity — two vital economy factors in any processing system.

**The maintenance "price tag"** — your assurance the Nettco drive will minimize maintenance: with a minimum of moving parts — all conservatively rated.

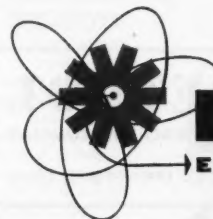
Next time use Nettco — for engineered agitation that's lowest cost in the long run. Send for data and recommendations, to New England Tank & Tower Company, 93 Tileston Street, Everett 49, Massachusetts.



Installation of Nettco Agitators in new multi-million dollar dyestuffs plant — complete plant served by Nettco Engineered Agitation.

### HELPFUL NETTCO CATALOGS

General Catalog No. 530  
Side Drive Agitators, Bulletin No. 532  
Nettco Flomix®, Bulletin No. 531



**NETTCO**  
ENGINEERED AGITATION

When inquiring check CP 5900 opposite last page

# don't be HALF INFORMED

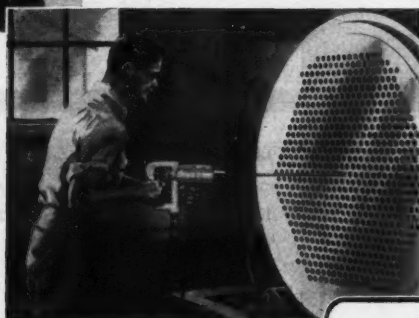
## get a DEMONSTRATION of the Airetool CC-4325

Become acquainted with the remarkable results obtainable from this condenser cleaner . . . it's the lightest, most flexible and mobile condenser cleaner ever offered on the market!

Say goodbye to bulky, cumbersome condenser cleaning equipment . . . gain new speed in your operations with the feather-light new AIRETOOL CC-4325. It weighs only 11 lbs. and is easily handheld by one man, with no supporting rig required! A high-speed two-stage air motor provides extra power to rapidly and completely clean scaled tubes, even those completely plugged with hardest deposits.

The AIRETOOL No. CC-4325 Condenser Cleaner, and a carbide-tipped drill, form a combination that is really speedy and efficient. The built-in hand-controlled flushing system removes chips from the drill point as you work. A wide variety of drill and brush heads are available to meet every condenser cleaning need . . . they're quicker, safer and thorough in cleaning condenser tubes.

WRITE TODAY for complete details about the CC-4325 and other AIRETOOL Tube Cleaning and Expanding Equipment. Ask for your demonstration appointment!



Remember . . . there's an AIRETOOL Tube Cleaner and Tube Expander for Every Type of Tubular Construction.

REPRESENTATIVES in principal cities of U.S.A., Canada, Mexico, South America, England, Japan  
BRANCH OFFICES: New York, Chicago Philadelphia, Tulsa, Houston, Baton Rouge



### AIRETOOL

MANUFACTURING COMPANY

SPRINGFIELD, OHIO

When inquiring check CP 5901 opposite last page

## MAINTENANCE

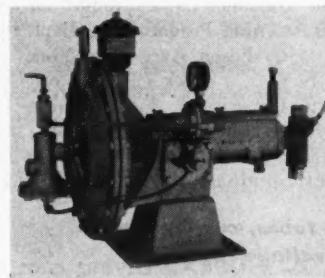
Discharge ratios to 497/1 provided by air-operated chemical pump . . .

vibration-free unit runs in oil bath

Uses: Chemical injection, proportioning, pressure lubrication, and fluid transfer. Units handle all kinds of aqueous solutions and liquid lubricants and, in their various types, will inject or proportion additives into lines of vessels carrying as much as 30,000 psi pressure.

Features: Pump is operated by air or gas pressure and provides discharge ratios up to 497/1, so that almost 25,000 psi discharge pressure may be obtained with only 50 psi operating pressure. Unit can be regulated to inject additives in exact proportions to volumes carried in lines or vessels.

Description: Positive displacement reciprocating pump has frame and body of high strength aluminum alloy. Pump mechanism is regularly made of stainless steel, with other materials furnished on special order.

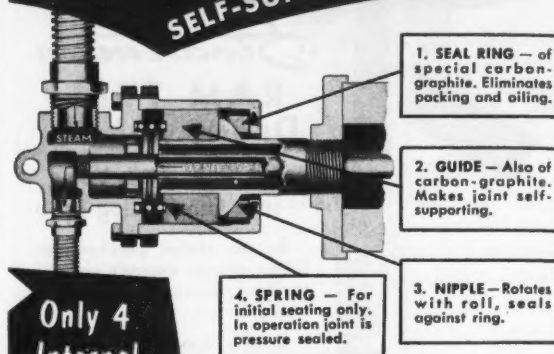


Pump handles all kinds of aqueous solutions and liquid lubricants

Unit operates in an oil bath, is sealed against dust and atmospheric influences, and is equipped with external controls. Weighing only 50 pounds, pump is vibration-free and will operate safely without being bolted down.

(Type MSM pump is a product of Texstream Corporation, Dept. CP, P. O. Box 9127, Houston, Texas . . . or for more information check CP 5902 on the convenient Reader Service slip located opposite last page.)

## JOHNSON Rotary Pressure JOINT SELF-SUPPORTING TYPE



Only 4  
Internal  
Parts

1. SEAL RING — of special carbon-graphite. Eliminates packing and oiling.
2. GUIDE — Also of carbon-graphite. Makes joint self-supporting.
3. NIPPLE — Rotates with roll, seals against ring.
4. SPRING — For initial seating only. In operation joint is pressure sealed.

For introducing steam and liquids into rotating rolls and cylinders, there's nothing like the Johnson Joint above. It's packless, self-lubricating, self-adjusting, self-supporting. It has been

adopted by dozens of machinery makers, and is finding new uses every day.

Type SB shown handles both steam and condensate through same head; also available for through flow service, and in sizes and styles for all operating conditions. Write for literature.

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 5903 opposite last page

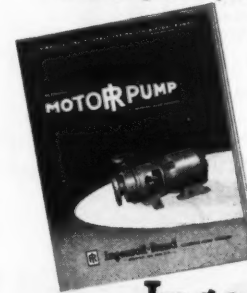
## Are Your Pumps Dependable?

Dependability of your pumps may mean the difference between uninterrupted production and complete shutdown. You cannot afford shutdowns due to mechanical failure in your pumping system. Switch to Ingersoll-Rand MOTORPUMPS for more dependability.

MOTORPUMPS mount in any position and require no special foundation. Select the right units for your job from the most complete line of space-saving centrifugal pumps manufactured. Write for our new Bulletin on this line from 1/4 through 75 horsepower . . . capacities to 2800 gallons per minute . . . heads to 650

feet. Prompt shipment from either factory or branch stock.

We can help you with any size pumping problem with units to 4000 horsepower.



### Ingersoll-Rand

9-160 11 Broadway, New York 4, N. Y.

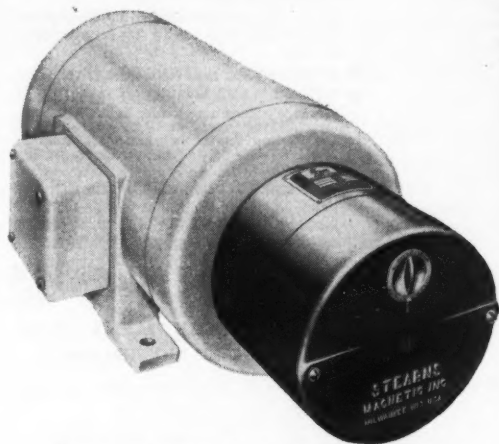
When inquiring check CP 5904 opposite last page

CHEMICAL PROCESSING

**Manual release-automatic reset  
featured on disc brake . . .**

units are designed for re-rated 3-20 hp motors

Re-designed magnetic disc brake being offered by manufacturer is for use on re-rated 3-20 hp motors. It is available in maximum torque ratings of 10, 15, 25, 35, 50, 70, 75 and 105 lb ft. Brake, designated H-70, is designed to mount on frame sizes 213 through 286 and is up to 15/16" shorter than previous brakes.



Unit is up to 15/16" shorter than previous brakes

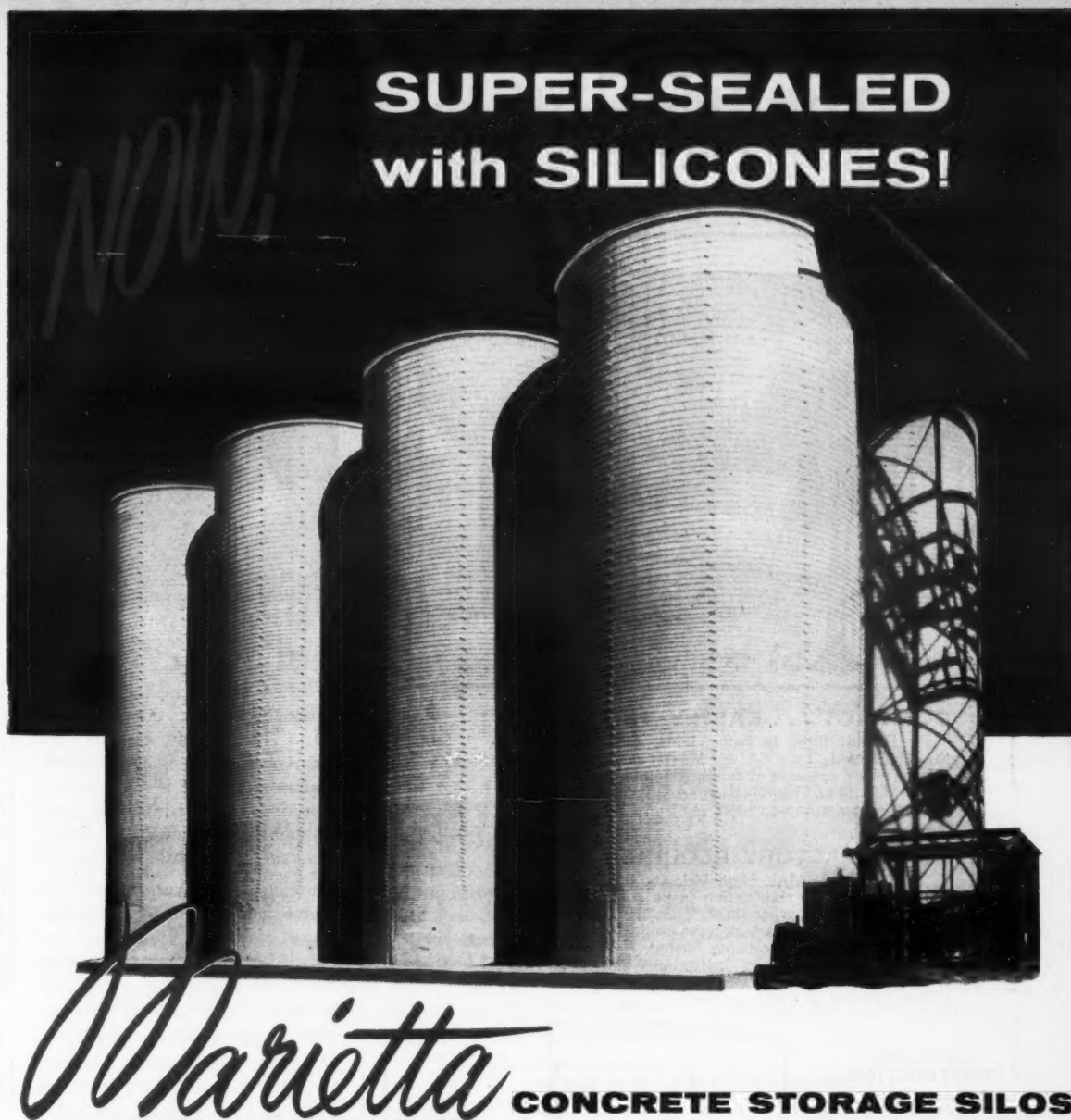
Feature of brake is manual release-automatic reset wear indicator. Spring set solenoid released brake is supplied for either horizontal and vertical motor mounting or independent floor mounting and is available with either standard or dust-tight, waterproof enclosure.

(Magnetic disc brake is a product of Stearns Magnetic Inc., Dept. CP, 620 S. 29th St., Milwaukee 46, Wisconsin . . . or for more information check CP 5905 on handy form opposite last page.)

**Discusses control of non-corrosives  
provided by compact valves**

Feature of two-way packless solenoid valve described in four-page bulletin is compact design. Compactness is illustrated by dimensions of normally closed valves: 3-13/16" high and 2-3/4" face to face. Valves may be used for controlling flow of air, gas, water, light oil, and other non-corrosive fluids. They are available normally closed or normally open, with standard, watertight, or explosion-proof solenoid enclosures.

Form 708 is available from Automatic Switch Co., Dept. CP, 391 Lakeside Ave., Orange, N. J. When inquiring check CP 5906 opp. last page.

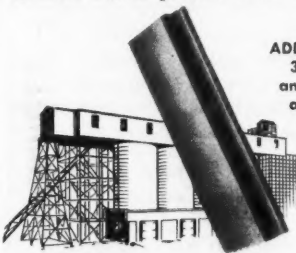
**SUPER-SEALED  
with SILICONES!**

GET GREATER PROTECTION for all your valuable raw materials . . . in powdered, granular or lump form . . . in Marietta Concrete Stave Silos — now coated with miraculous silicones!

Don't risk loss from spoilage or deterioration . . . when expertly-engineered Marietta Industrial Storage Systems provide superior protection . . . and cut wastage! Modern Marietta Concrete Storage Silos built with Air-Cell or solid concrete staves provide three lines of defense against the

ravages of moisture and freezing cold . . . heavier, stronger staves, plus flexibility of design . . . and an outside finish coat sealed with an impenetrable film of silicone compound which also prevents staining and efflorescence; insuring you that your Marietta Concrete Storage System will not only look better, but serve you longer!

Write for catalog giving details today . . . find out how a Marietta-designed storage system can improve your handling facilities and lower operating costs.



ADDED STRENGTH is provided by full 3 1/4" thick precast concrete staves and heavy hooping . . . more than ample to support heavy vibrators, shaker screens and other needed equipment on silo tops or sides . . . where deadweight of silo storage system is a factor, staves may be supplied cast from lightweight aggregate.

THE

*Marietta*

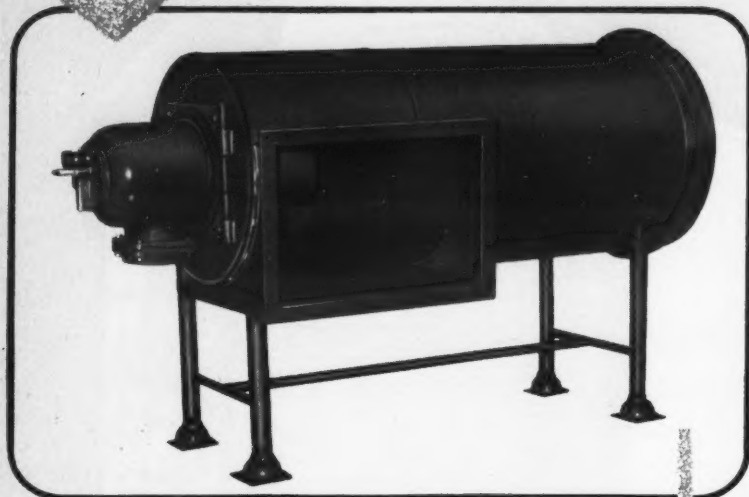
Precast Concrete  
Products for Farm,  
Home and Industry

**CONCRETE CORPORATION**  
MARIETTA, OHIO

BRANCH OFFICES: 501 Fifth Ave., New York 17, N. Y.; Pulaski Hwy. at Race Rd., Baltimore 21, Md.; 411 Foster St., Nashville, Tenn.; Box 5192, Charlotte 6, N. C.; Hollywood, Fla.; Box 592, Jamestown, New York. REPRESENTATIVES in principal cities.

When inquiring check CP 5907 opposite last page

## THERMAL TYPE CA DIRECT FIRED AIR HEATERS



### COMPACT... EASILY INSTALLED

Readily fitted to ovens, kilns, spray dryers, etc., the THERMAL Type CA Air Heater is an ideal source of heat where products of combustion may be mixed with the air. Oil, gas or combination firing is available without change in heater construction.

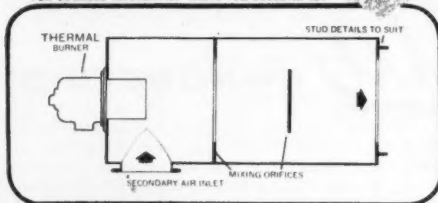
### NO REFRACTORY REQUIRED...

The THERMAL High Velocity Burner built into the heater permits combustion to be substantially completed within the burner itself. Thus the heater is basically a mixing chamber wherein the products of combustion are mixed with the air being heated. Refractory is not normally used. Successful applications have been made ranging from under 200,000 BTU/hr. to over 20,000,000 BTU/hr. and at all pressure levels.

### UNITIZED CONSTRUCTION

Initial cost and upkeep is kept at a minimum through the use of all welded, all metal construction. The CA Air Heaters are normally supplied as complete "package" installations.

FOR DETAILED INFORMATION WRITE FOR BULLETIN 104



OTHER THERMAL PRODUCTS & SERVICES



Gas, Oil & Combination Gas-Oil Burners •  
Heat Exchangers • Submerged Combustion •  
Combustion & Heat Transfer Engineering

# THERMAL

Thermal Research & Engineering Corp.

CONSHOHOCKEN • PENNSYLVANIA

REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 5908 opposite last page

## MAINTENANCE

Rooms up to 7500 cu ft  
deodorized for a few  
cents per month...

variety of fragrances can re-  
place unwanted odors

**Uses:** For deodorizing spaces up to 7500 cubic feet in volume, unit is recommended for use in any room where customers, employees, or public would be subjected to unpleasant odors.



Deodorizer plugs into any AC electric outlet

**Features:** In neutralizing objectionable odors, deodorizer replaces them with pleasant fragrances of spice, pine, floral bouquets, or cedar. It is also said that operating costs of the unit on a 24-hour basis amounts to only a few cents per month.

**Description:** Ivory colored, fan-operated unit is almost like a miniature radio in appearance and size. It operates simply by plugging into any AC electric outlet and becomes effective immediately.

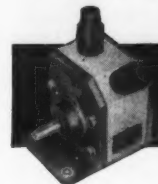
(Wilco Air Freshener deodorizer is a product of Williams Chemical Co., Dept. CP, 487 Broadway, New York 13, N. Y. ... check CP 5909 opposite last page.)

### Seals concrete surfaces against damage

Sealer for concrete surfaces which prevents "dusting" and protects against damaging effects of food acids, grease, oil, and abrasive wear is described in pocket-size folder.

Folder on Stontop is issued by Stonhard Company, Dept. CP, 1306 Spring Garden St., Philadelphia 23, Pa. Specify CP 5910 opposite last page.

VANTON  
PUMP  
TAMES  
CORROSIVE  
CHEMICALS



rigid-unplasticized PVC  
flex-i-liner PUMPS

are designed to handle the toughest corrosive chemicals and abrasive slurries.

The durable precision molded flexible liner and the pump body block are the only parts contacting the fluid.

- No stuffing boxes, shaft seals, check valves, glands or gaskets to worry about.

Body blocks in: Polyethylene, Bakelite, Buna N, Hard Rubber, unplasticized PVC, Stainless Steel. Flexible liners in: Natural and pure gum rubber, Neoprene, Hycar, Buna N, Vinyl, Compac and Silicone. The wise choice of materials means trouble free, corrosion free service.

Pump capacities from fractional to 20 gpm. Illustrated booklet on request, as well as descriptive literature on complete line of corrosion resistant centrifugal pumps, valves, pipe and fittings.



## VANTON

PUMP & EQUIPMENT CORP.  
201 SWEETLAND AVE., HILLSIDE, N. J.

When inquiring check CP 5911 opposite last page

## REPUBLIC VALVES

INDUSTRIAL • CHEMICAL • AIRCRAFT

### J.I.C. AND AN STANDARD TUBE ENDS

Skilfully engineered 2, 3, and 4-way Plug Valves are built by Republic in brass and aluminum alloy, sizes 1/8" to 1". Hydraulic Relief Valves opening at pressures up to 450 psi made in brass, aluminum alloy, steel, and stainless steel, sizes 1/8" to 3/4". Pipe, AN or J.I.C. tube ends, or combinations.



Also manufacturers of high quality globe, needle, low and hy-pressure check valves, and special valves to specifications.

Write for complete catalog and name of nearest distributor.



**RM** REPUBLIC MANUFACTURING CO.  
15655 BROOKPARK ROAD • CLEVELAND 11, OHIO

When inquiring check CP 5912 opposite last page

CHEMICAL PROCESSING

**Large volume of air is used  
to atomize paint handled  
by spray equipment . . .**

lightweight, portable units are available for hot or cold applications

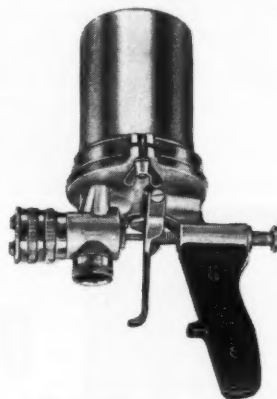
**Uses:** Hot or cold application of paints, varnishes, waxes, thermoplastics, and similar materials.

**Features:** Both models of hot and cold spraying equipment use a large volume of air to atomize material rather than high-pressure air. This principle permits the use of larger nozzle orifice which, together with gravity feed from inverted container and slight positive air pressure within container, allows spray gun to be useful for extremely viscous colloid-suspension materials.

**Description:** For cold spray application, air at 3500 cu ft/hr is provided by the Volumaire R200 Turboblaster, which is powered by a 1/6 hp motor operating on 110v, 60 cy single-phase current. Weighing only seven pounds, the blower can be slung from the shoulder by strap provided for the purpose, or rested on floor on its stand. The spray gun uses one all-purpose nozzle to apply all fluids.

For hot spraying of materials which melt in the range between 174 and 400°F, the Volumaire Model R350 spray gun is used. Air is supplied by this model's Turboblaster at 3500 cu ft/hr and 1 1/2 psi pressure, heated to melting point of material. Electrical resistance heater in spray gun container holds material at approximate spraying temperature. Entire outfit is portable. Model R350 is powered by the same motor as Model R200.

(Hot and cold spraying equipment is product of Roxon, Inc., Dept. CP, 50 Broad St., New York 4, N. Y. . . or for more information check CP 5913 on handy form opposite last page.)



Model R200 spray gun for cold spray applications

**Your guide to more ideas concerning  
Engineering and Maintenance . . .**

is the handy Product Directory on pages 201 to 204. All products and services discussed in this issue, in either editorial or advertising, are listed there.

## WHEN OXIDATION IS A PRIME FACTOR

$$\text{Optimum tube for the job} = \frac{[(\text{pressure}) \times (\text{diameter})^2 \times (\text{allowable stress})]}{[(\text{flow rate})^2 \times (\text{sp. vol.}) \times (\text{density}) \times (\text{Ni} + \% \text{ Cr, temp, atmos})]}$$

## Tube Selection Cannot be Reduced to a Formula —even a complicated one

When any metal is exposed to high temperatures, it burns. Slow burning is called oxidation and in the process scale forms on the metal being burned. If the process continues the scale will flake off, causing loss of metal.

One of the major benefits resulting from alloying chromium with iron is greatly increased resistance to oxidation at high temperatures. A tight surface layer of chromium-rich oxide is formed and this layer retards oxygen diffusion. Tests have shown that resistance of chromium alloy steel to oxidation is directly proportional to the chromium content of the

alloy. The chart below compares relative oxidation resistance at 1200 F of stainless and carbon steels, as determined by scale loss on heating 250 hours.

But only an expert can properly evaluate all of the elements that make up the best analysis to match the requirements of your specific tubing application. There is no substitute for the kind of experience with these problems you'll find at B&W.

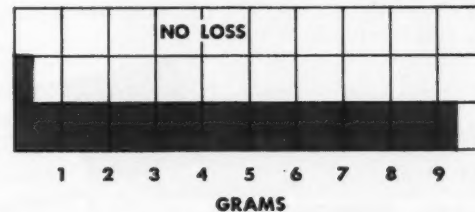
To get the most benefit from B&W's long experience in matching tubes to jobs, call on Mr. Tubes, your nearby B&W Tube Representative. He can help you make the best choice.

GRAMS LOSS—250 HOURS AT 1200 F

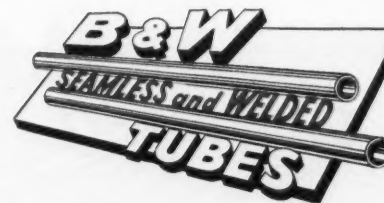
CROLOY 18-85 (18% Cr, 8% Ni) ▶

CROLOY 12 (12% Cr) ▶

CARBON STEEL ▶



THE BABCOCK & WILCOX COMPANY  
TUBULAR PRODUCTS DIVISION  
Beaver Falls, Pa. —Seamless Tubing; Welded Stainless Steel Tubing  
Alliance, Ohio—Welded Carbon Steel Tubing



TA-4060(P)

When inquiring check CP 5914 opposite last page

# WANTED: **CHEMICAL PROCESSING** readers with insulation problems . . .



You can't beat  
this all-purpose  
insulation for  
EASY  
APPLICATION  
EFFICIENCY  
and  
COVERAGE

**BALDWIN-HILL**

## No. 1 INSULATING CEMENT

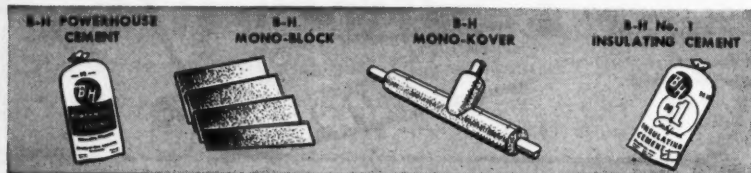


- Plastic insulation—easily troweled on large or small irregular surfaces.
- Effective up to 1800° F... Reclaimable to temperature of 1200° F.
- Low heat loss because of high temperature resisting mineral wool base.
- Coverage, 50 sq. ft. 1 in. thick per 100 lbs... Low cost maintenance insulation.

**Baldwin-Hill**  
COMPANY

403 BREUNIG AVE., TRENTON, N.J.

Kalamazoo, Mich. • Huntington, Ind. • Temple, Tex.



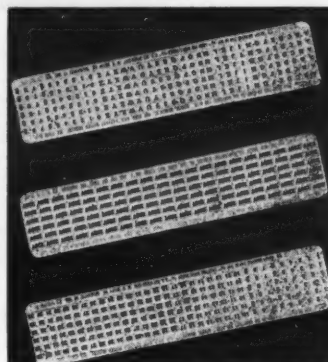
When inquiring check CP 5915 opposite last page

## MAINTENANCE

**Temperatures to 300°F  
withstood by markers  
for wires, motors**

**Uses:** Permanent identification of wires, circuits, motors, coils, and panels.

**Features:** Self-adhering wire markers will withstand continuous heat to 300°F, intermittent heat to



Markers are mounted on handy dispenser cards

450°F, and continuous cold to -300°F. Markers are treated with silicone plastic coating which protects them from dirt, dust, grease, moisture, and abrasion.

**Description:** Wire markers are mounted on handy dispenser cards and are easy to remove and apply. They come in a variety of numbers, letters, symbols, and colors. Stock sizes are 1½" long, markers for wires over ¼" OD, and ¾" long markers for small gage wires.

(Wire markers are products of W. H. Brady Co., Dept. CP, 727 W. Glendale Ave., Milwaukee 12, Wisc. . . or for more information check CP 5916 opp. last page.)

## Heaters for small tanks described in bulletin

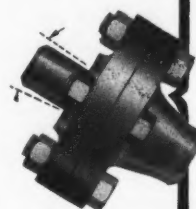
Bayonet heaters for small and medium-sized tanks are described in four-page bulletin.

Bul 3006 is issued by Drayer-Hanson, Inc., Dept. CP, Box 2215, Terminal Annex, Los Angeles 54, Calif. Specify CP 5917 opposite last page.

## The Modern Way

to handle

- STRESS LOADS
- VIBRATION
- WIND SWAY
- THERMAL MOVEMENTS



—on TOWERS,  
STACKS,  
LARGE PIPING

## Barco Flexible STRUT\* Joints

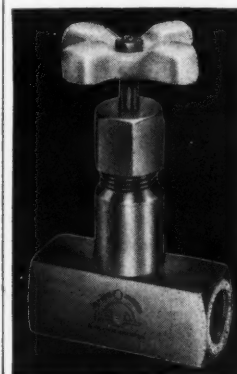
\* For Structural Applications

NOW you can design flexibility into structural supports in refineries the modern, efficient way with Barco Flexible Strut Joints. Typical uses are in flexible struts for supporting or bracing large catalyst lines, vent stacks on fluid catalytic crackers, guying tall vessels or columns. Where horizontal pipe lines require supports, two braces with Barco Flexible Strut Joints replace costly "A" frames. Strut joints are also used to direct and control thermal movements of high temperature piping.

The simple ball and socket design of the Barco Strut Joint insures flexibility in struts and guy rods without future maintenance. Just install them and forget them. These joints handle high load factors in compression or tension without the noise, wear and eventual failure of pin and clevis type braces.

Barco field engineers are always available. Specifications and information on request. BARCO MANUFACTURING CO. 537D Hough St., Barrington, Ill.

When inquiring check CP 5918 opposite last page

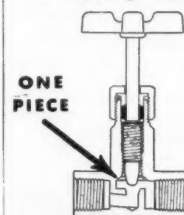


## New MARSH Needle Valves

MAXIMUM  
WORKING PRESSURE  
10,000 PSI

## . . . for finer regulation of water, oil or gas

First needle valve to combine all the characteristics called for in modern industry. Embodies sturdiest basic construction—machined from solid bar stock—suitable for pressures to 10,000 psi and equally efficient in lower range. Note



stem guide fused to body by new "Conoweld" process, eliminating faults of conventional two-piece valves. Stem 416 stainless steel. Stem threads fine pitch for strength and micrometer regulation. Body electro-zinc plated. Sizes ½" to 1", globe and angle patterns.

Ask for new Needle Valve Catalog

MARSH INSTRUMENT CO. Sales Affiliate of Jas. P. Marsh Corp. Dpt. Z. Skokie, Ill.

When inquiring check CP 5919 opposite last page

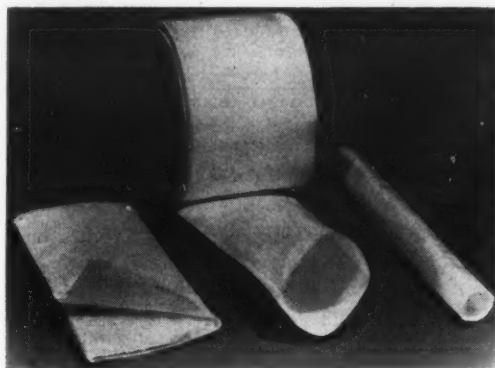
CHEMICAL PROCESSING

**Fiber glass tubular sleeving  
can't be stretched, won't  
lose shape . . .**

material is resistant to heat and moisture

**Uses:** As treated and untreated coverings for wire and cable, flexible ducting, plastic reinforcement, and as containers for various insulation and filtration materials.

**Features:** Sleeving cannot be stretched under tension and will not lose its tubular shape when filled or pulled. It is sun and heat resistant, unaffected by weather or humidity, and will not absorb water.



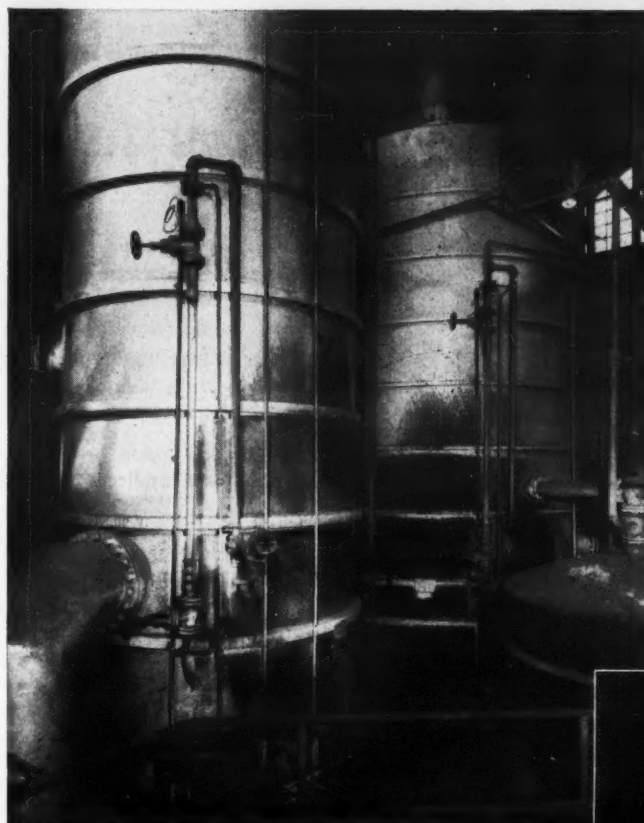
**Description:** Woven fiber glass sleeving is being produced on a quantity basis and is available in flat widths of from one to six inches and in continuous or cut lengths according to specification.

(Fiber glass sleeving is a product of Hess, Goldsmith & Co., Inc., Dept. CP, 1400 Broadway, New York, N.Y. Check CP 5920 opposite last page.)



" . . . and now we present our next speaker, whose topic, 'Maintenance of Miniature Instruments', is . . . "

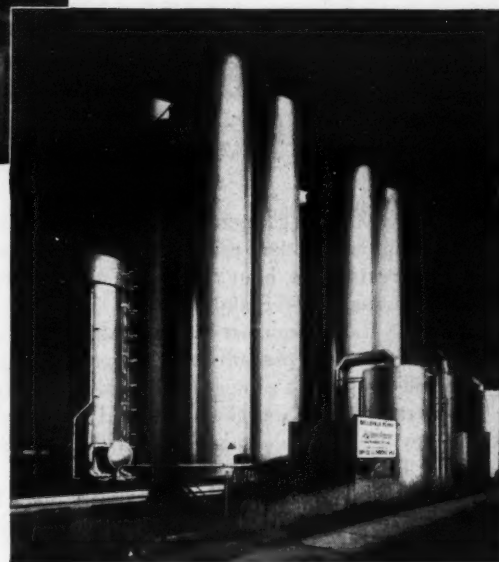
# A Chemical Plant Needs . . .



Conkey all nickel construction Triple Effect Evaporators producing 50 per cent caustic liquor.

● Conkey designed and engineered equipment, such as the Conkey all nickel construction Triple Effect Evaporator shown above, is fabricated in Chicago Bridge & Iron Company's four strategically located shops and erected by CB&I experienced crews. Conkey engineers will be happy to assist you with any crystallizing, evaporating or filtering problems your plant may have.

● CB&I designs, fabricates and erects welded steel plate structures of all types. The CO<sub>2</sub> towers shown at the right were erected for the Liquid Carbonic Corporation plant at Belleville, N. J. When you plan processing equipment, pressure storage tanks or flat-bottom storage tanks, write our nearest office.



Eight 12-ft. diam. by 100-ft. carbon dioxide towers fabricated and erected by CB&I.

**Filters  
Evaporators  
Crystallizers  
Processing Towers  
Pressure Vessels  
Flat Bottom Tanks**

. . . and many other welded steel plate structures, all built to exacting standards. Conkey and CB&I engineers are ready to help solve your problems. Just write your nearest CB&I office for further information, estimates or quotations.

## CHICAGO BRIDGE & IRON COMPANY

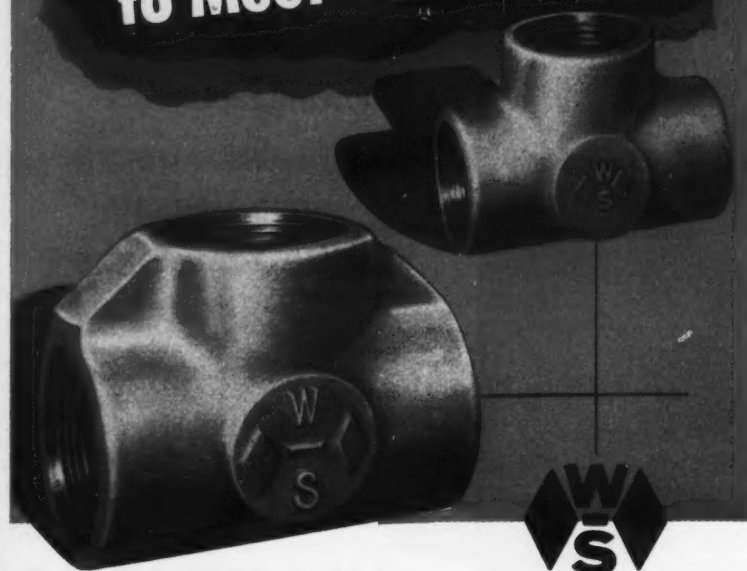
HAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

**CONKEY  
EQUIPMENT**

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston  
Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City  
San Francisco • Seattle • Tulsa • Washington

When inquiring check CP 5922 opposite last page

**ADDED TO OUR LINE**  
**to Meet Your Needs**



## **New WATSON-STILLMAN 150 LB. STAINLESS STEEL PIPE FITTINGS, Types 304, 316**

Now you can get performance-proved Watson-Stillman Fittings for standard pressure services that need the corrosion resistance, heat resistance and low temperature toughness of 18-8 Stainless Steel.

W-S 150 lb. Stainless Fittings, rated at 400 psi cold non-shock working pressure and 150 psi steam pressure, are ideal for process piping, refrigeration systems, high temperature liquid and gas piping and other piping systems. They are available in both Screw-End and Socket-Welding Types in sizes  $\frac{1}{2}$ " to 2".

The new Watson-Stillman Stainless Steel Fittings will assure you of long, trouble-free service in tough piping applications... will reduce down-time and cut maintenance costs. For full technical information on these fittings write today for Bulletin S-3-55.

**Sold Through Leading Distributors**



## **WATSON-STILLMAN FITTINGS DIVISION**



**H. K. PORTER COMPANY, INC.**  
Roselle, New Jersey

10

When inquiring check CP 5923 opposite last page

## **engineering and maintenance**

Having an operating principle akin to the automobile's torque-conversion transmission, this unit . . .

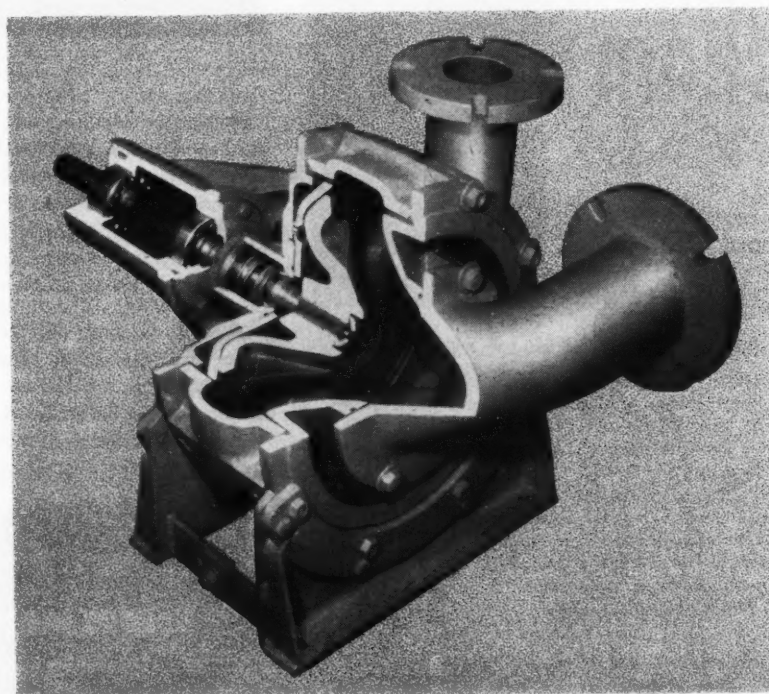
## **pumps solids without clogging**

**Recessed impeller that's entirely out of flow pattern provides unobstructed passage, is protected from wear, and won't harm materials being transported**

Soft, fibrous, coarse, or abrasive fluid-borne materials are handled with equal facility by non-clogging solids pump. Traveling through the completely open pump case, materials such as fish (even live goldfish), grapes, and cherries are not damaged; nor will heavy pulps or abrasives such as ground ore (up to 80% solids content in stream), ready-mix cement, or raw sewage clog or harm the impeller. Strong, positive suction insures against clogging of intake line.

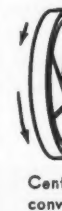
Recessed impeller, though entirely out of material flow pattern, induces a vortex (swirl) that does the pumping. Centrifugal vortex action imparted to the fluid extends into intake pipe, conveys solid materials through pump — generally in a single whirl within the casing. Rotating fluid mass forms a buffer between impeller and solid particles in flow so that few of them even touch the impeller, hence no bruising or damaging of product. This same design feature provides pump parts with protection from excessive wear.

In addition, impeller being out of main flow path insures unobstructed passage of any liquid-solid combination that will pass through piping itself, thus eliminating any possibility of clogging. As an example one of these pumps (an early "hand-made" ver-



Location of impeller out of main flow path insures unobstructed passage of any liquid-solid combination that will pass through pipe itself

Ro  
im  
me  
bu  
sol  
fev



sion) ha  
sludge a  
time it  
used in  
times a

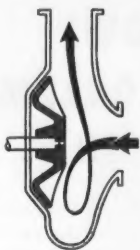
Pump h  
complete  
turbine  
charge c  
or front  
ward di  
stantane  
pump in  
to 4000  
100 ft.

Units an  
stainless  
corrosio

(Wemco  
of West  
St., San  
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reader r  
ient Res  
last pag

Quick

Rotating fluid (induced by impeller) forms the carrying medium. Fluid mass forms a buffer between impeller and solid particles in flow, so that few of them ever touch the impeller



Centrifugal vortex action extends into intake pipe, conveys solid materials through pump — generally in a single whirl within casing

sion) has been operating for a year pumping raw sludge at a West Coast sewage plant. During that time it has not clogged once, while units formerly used in the operation had to be unplugged several times a week.

Pump has been engineered for rapid disassembly, complete or partial, from either end without disturbing piping. Angular adjustment of inlet or discharge direction is possible by rotating pump case or front case housing, respectively (vertically downward discharge not possible). Dump valve for instantaneous drainage of pump and lines for quick pump inspection are optional. Capacities from 160 to 4000 gpm (water) are attained with heads to 100 ft.

Units are constructed of Ni Hard or special steels, stainless steel, bronze, and other alloys to meet corrosion and sanitation problems.

(Wemco Torque-Flow solids pump is a development of Western Machinery Co., Dept. CP, 760 Folsom St., San Francisco 7, Calif. . . . or for more information concerning manufacturer's product, reader may simply check CP 5924 on the convenient Reader Service slip which is located opposite last page.)

Quickest method of finding hopper volume  
— page 190



Insulation is snapped on 8" pipe



Staples are used to close seam

Texas City Chemical Company takes advantage of —

## LOWER HEAT LOSSES, LOWER COST with new G-B SNAP\*ON Pipe Insulation

**Company saves 32,000 Btu per hour,  
with 1/2" less wall thickness**

**Problem:** Over 1700 feet of pipe that was to carry steam or molten sulfur at temperatures up to 300° F. had to be insulated at Texas City Chemical Company's new dicalcium phosphate and sulfuric acid plants at Texas City, Texas.

**Solution:** Company's chief engineer approved G-B Snap\*On glass fiber insulation, when calculations showed less heat loss at a lower material cost than another widely-used insulation material.

The pipe insulation, composed of fine glass fibers bonded with phenolic resin, was supplied in standard one-piece sections six feet in length. It was spread apart at the seam and snapped-in-place on the pipe. Results: Besides material and heat savings, the insulation contractor (Precision Insulating Co.) reports that the applied costs were 20% less than the job estimate (based on time standards for other insulating materials).

At 300° F. mean temperature, the heat loss comparison was calculated for the job. (See table.) At this temperature, a savings of over 30,000 Btu per hour was found. This improved insulation performance resulted even with 1/2" less wall thickness.

As the insulation did not chip, break, or crumble, no tailings were left around installation area.

G-B Snap\*On glass fiber pipe insulation is available in sizes that will fit pipe from 3/4 inch to 33 inches nominal diameter, inclusive.

Write today for samples and full details or call G-B Snap\*On distributors (in the Yellow Pages) who carry local stocks in 72 cities.

### Heat Loss Comparison Snap\*On vs Competitive Insulation

| Nominal<br>pipe<br>size | Length<br>(ft) | Competi-<br>tive in-<br>sulation<br>thickness | Btu/ft<br>loss<br>(300°F) | G-B<br>Snap*On<br>insulation<br>thickness | Btu/ft<br>loss<br>(300°F) | Total<br>Btu<br>savings<br>per hr |
|-------------------------|----------------|---|---------------------------|---|---------------------------|-----------------------------------|
| 8"                      | 444            | 2   | 120                       | 1 1/2                                     | 91                        | 12,876                            |
| 6                       | 6              | 2   | 97                        | 1 1/2                                     | 76                        | 126                               |
| 4                       | 300            | 2   | 73                        | 1 1/2                                     | 53                        | 6000                              |
| 3                       | 582            | 1 1/2   | 73                        | 1   | 59                        | 8148                              |
| 2                       | 432            | 1 1/2   | 53                        | 1   | 43                        | 5184                              |
|                         | 1764           |   |                           |   |                           | 32,304                            |

# GUSTIN-BACON

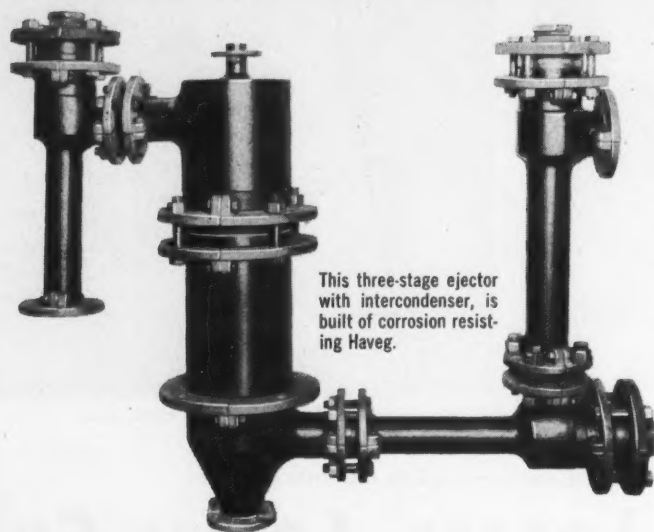
Manufacturing Company



Thermal and acoustical glass fiber insulations • Pipe Couplings and fittings • Railroad gaskets and supplies  
254 W. 10th St., Kansas City, Mo.

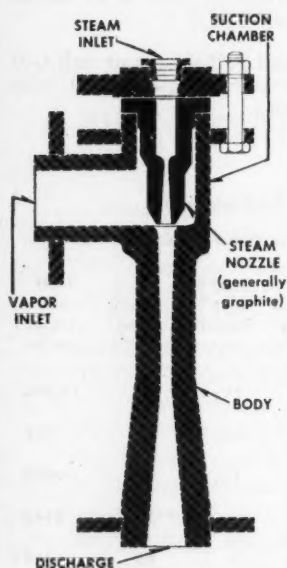
When inquiring check CP 5925 opposite last page

# Designed to handle corrosive vapors



This three-stage ejector with intercondenser, is built of corrosion resistant Havg.

## ELLIOTT *Steam Jet* EJECTORS TYPE H



Cross-section, showing construction details of Type H ejector. Conventional split flanges are used. Nozzle is easily replaceable.

When it comes to maintaining vacuum, while handling highly corrosive vapors, you can't beat these durable Elliott Type H ejectors. Made of Havg, Permanite or similar corrosion-resistant synthetic resin material, they'll stand up to hydrochloric and sulphuric acids, wet chlorine, caustic, benzene and many other corrosive vapors, including some of the chlorinated aromatic compounds.

Whatever your vacuum requirements, take advantage of the experience and know-how of an Elliott ejector specialist. There's no obligation on your part. Contact your Elliott representative or write Elliott Company, Jeannette, Pa. for descriptive bulletins.

**ELLIOTT Company**

STEAM TURBINES • MOTORS • GENERATORS • HEATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TURBINE CLEANERS • STRAINERS

G5-2

When inquiring check CP 5926 opposite last page

## MAINTENANCE

### Lubricates machines at predetermined intervals

**Uses:** Automatic application of fluid lubricants to bearings on individual industrial machines at predetermined intervals.

**Features:** Control of air-operated central lube system may be by any of three methods: mechanical, electrical, or manual.

**Description:** Centralized lubrication system was developed to fulfill need for servicing machines operating at varying rates of speed where applications of lubricant at varying intervals is required.

System includes an automatic safety control which stops machine if air supply to pump fails, lubricant reservoir is empty, or lubricant supply line is damaged.

Mechanical control of system utilizes motion of machine to actuate air valve which in turn cycles lubrication system. Electrical control utilizes an adjustable time clock to actuate a solenoid air valve which in turn cycles lubrication system at intervals of 7 1/2 minutes to 3 hours. Manual control system utilizes an air valve actuated by machine operator.

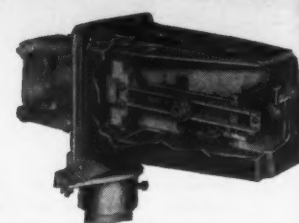
(Power-Drive centralized lubrication system is a development of Lincoln Engineering Co., Industrial Division, Dept. CP, 5780 Natural Bridge Ave., St. Louis 20, Mo. Check CP 5927 opposite last page.)

### Stress rupture data on high-temp tube

Card, punched for notebook insertion, presents stress rupture data on eleven tubing steels used in high-temperature service. Included among these steels are carbon steel, intermediate chrome-molybdenum steels, and stainless steels.

TDC 153-A is available from Tubular Products Division, The Babcock & Wilcox Company, Dept. CP, 4029 4th Ave., Beaver Falls, Pa. When inquiring specify CP 5928 opposite last page.

## TRICKY FLOW PROBLEMS



### solved by simple Transmitter!

**T**HE New Taylor TRANSAIRE\* Differential Pressure Transmitter is designed to meet present day requirements for a rugged, dependable and accurate pneumatic instrument to measure flow, liquid level, or specific gravity. Compact design, force-balance action, dry (mercuryless) type. Ten-to-one adjustability in each of two ranges: 20-200" water; 80-800" water. Inexpensive, simple to install. Economical and easy to maintain.

Ask your Taylor Field Engineer for full details of this new transmitter, or write for Bulletin 98097. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

\*Reg. U.S. Pat. Off.

*Taylor Instruments*  
**MEAN ACCURACY FIRST**

When inquiring check CP 5929 opposite last page



### Marman Designed for the food and chemical processing industries...

field tested on creamery tank truck hoses for more than a year. Wide strap grips hose tight without cutting. Quick-coupler and wing nut will not vibrate loose. Specify where requirements include ruggedness and dependability under constant cleaning and reuse.

Order 17340 Hose Clamp, state hose O.D. to 1/16"

Series No. 17340 — 2.50

Write, wire or phone Dept. CP-355

THERE IS A MARMAN  
CLAMP OR COUPLING  
AT EVERY GOOD JOINT

**MARMAN**  
PRODUCTS CO. Inc.  
11214 EXPOSITION BLVD  
LOS ANGELES 64 CALIF.

7-443

When inquiring check CP 5930 opposite last page

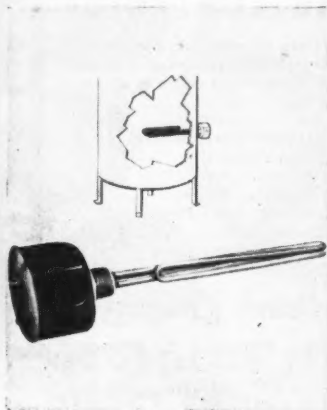
CHEMICAL PROCESSING

## MAINTENANCE

### Separate heat control on immersion unit not needed . . .

built-in thermostat maintains  
temps in range 120 to 180°F

**Uses:** Conversion of any domestic water tank up to 110 gal capacity to automatic electric heating. Units are also applicable to steam tanks and laboratory equipment.



One-piece immersion heater combines thermostat, heating element

**Features:** An integral part of heater, thermostat control unit eliminates the necessity for a separately mounted and wired temperature regulating device. Thermostat may be adjusted to maintain constant water temperatures in a range from 120 to 180°F.

**Description:** Immersion heater is a one-piece unit combining thermostatic control and Corox heating element. To install, heater is merely screwed into tank through a threaded one-inch pipe opening in the tank wall and proper wiring connections made.

(Immersion heater is a product of Westinghouse Electric Corp., Dept. CP, 401 Liberty Ave., Box 2278, Pittsburgh 30, Pa. . . check CP 5931 opposite last page.)

For more information on product at right, specify CP 5932 . . . see information request blank opposite last page.

## FOAMGLAS®

the cellular, stay-dry insulation



Insulation Contractor: Combustion Equipment & Insulation Co., Cleveland, Ohio

SOHIO gets efficient desalting because . . .

## Spillage-proof FOAMGLAS insulation stays effective to hold precise temperature

Efficient electric desalting to remove salts and other impurities from crude charging stocks demands precise temperature control throughout the process. The influent temperature (180° F to 220° F depending on viscosity of crude) must be held constant until effluence. Since there's no exchange of heat inside the sphere, it must be insulated very effectively.

For six years Standard Oil Company (Ohio) has maintained peak desalting efficiency by insulating their spheres in Cleveland, Lima and Toledo with FOAMGLAS. This unique cellular glass insulation benefits SOHIO three ways:

1. **Spillage-proof**, moisture-proof FOAMGLAS retains its insulating value . . . avoids fire hazard.
2. **Easy-to-apply** FOAMGLAS blocks are lightweight but very strong, readily

applied to sphere, eliminating insulation supports.

3. **Effective insulation** holds temperature required for electric field to break continuously the water and oil emulsion. It also prevents temperature drop near vessel wall . . . avoids thermal currents which would interfere with process.

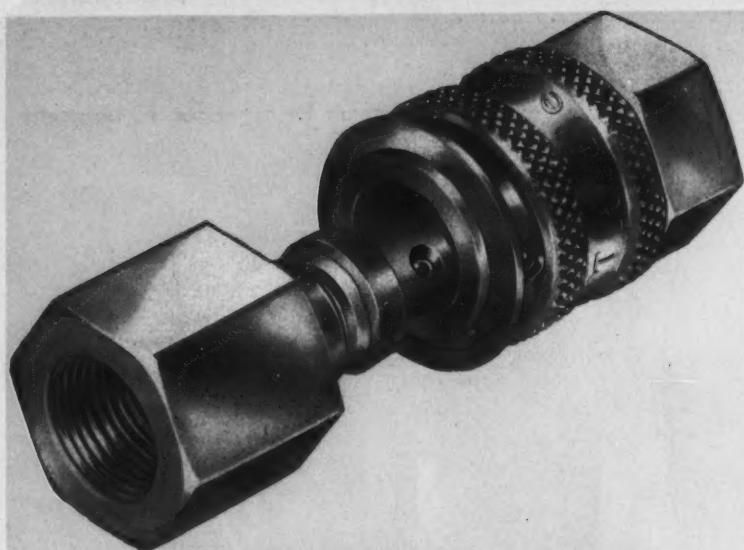
You'll benefit too by using this unique insulation. For more facts please write for booklets on FOAMGLAS for piping or tanks and equipment.

2" thick FOAMGLAS blocks cut to 12 x 12 size were laid diamond shape on SOHIO'S desalter sphere in Toledo. Two Nelson studs were welded through each block and secured with recessed Tinnerman speed clips. After asphalt cutback (Insulmastic 4010)—glass fabric—cutback application, the surface was finished with an asphalt base aluminum paint.

### Pittsburgh Corning Corporation

Dept. CP-35, One Gateway Center  
Pittsburgh 22, Pennsylvania  
In Canada: 57 Bloor St. W., Toronto, Ontario





## end your quick coupling problems the QUICK-SEAL way

If you haven't seen the new Titeflex QUICK-SEAL Straight-through and Check-valve Couplings—you have a pleasant surprise coming. These new Couplings . . .

1. Are leakproof. The higher the pressure, the tighter the seal.
2. Couple and uncouple in ONE SECOND—without tools.
3. Prevent hose kinking—through their 360° swivel action.
4. Are slim, easy to handle, not awkward and bulky.
5. Have no projections to snag or bend.
6. Have heat-treated steel bearing surfaces and stainless steel ball bearings and springs for long life.
7. Are made in a variety of alloys and in many sizes up to 12" diameter. Are interchangeable in the same size.

Titeflex QUICK-SEAL Couplings are made in the following types—Straight-through, Single- and Double-Check-valves. The Straight-through type has a smooth bore for free flow without obstructions. Write today for Titeflex QUICK-SEAL Coupling Catalog.



**Titeflex, Inc.**  
Industrial Products Division  
509 Hendee Street  
Springfield, Mass.

### Titeflex

QUICK-SEAL COUPLINGS

I'm interested in the possibilities for your new Quick-Seal Hose Coupling. Send me complete catalog—no obligation of course.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**The HIGHER the Pressure the TIGHTER the Seal**

When inquiring check CP 5933 opposite last page

## MAINTENANCE

**Protects, restores tanks and remains inert, won't contaminate . . .**

lining withstands temperature changes within 34 to 230°F

**Uses:** Protecting and restoring water tanks.

**Features:** As a lining system, this ceramic material has the ability to expand and contract with the iron or steel to which it is bonded.

The 1/4" protective layer obtained with this lining will not crack or otherwise fail when subjected to temperatures from 34 to 230°F. Its effectiveness in preventing tank corrosion by commercially neutral water is not impaired by this extreme temperature fluctuation.

**Description:** Tank lining has excellent adhesion, complete inertness to hot or cold water, no chance of contaminating contents, resistance to sludge and lime buildup, increased heat exchange rates and good insulating value.

(Expansol tank lining system is a development of Emjay Maintenance Engineers, Dept. CP, 327 Union Ave., Rutherford, N. J. . . . or for more information check CP 5934 on handy form opposite last page.)

**One moving part in traps protected against wear**

Design simplicity and low maintenance and repair are themes of four-page bulletin on steam and air traps. The one moving part in the traps is protected from wear and corrosion. Economy and simplicity of operation of the units is explained. Various traps are pictured and flow capacities are tabulated.

Form 5415 is issued by The C. E. Squires Co., Dept. CP, 18502 Syracuse Ave., Cleveland 10, Ohio. When inquiring concerning manufacturer's product, specify CP 5935 on handy form opposite last page.

**ACCURATE**

## Lumenite Electronic LIQUID LEVEL CONTROLS

With no floats—no moving parts in the container (except non-conductive liquids) these Lumenite Electronic Liquid Level Controls maintain exact levels of water, milk, syrups, etc., in tanks, reservoirs, boilers, processors, freezers—either open or under high pressure.

**Clean—Sanitary**

**Simple to Install**

**Require no Servicing**

Write for

- Bulletin FLM—on Liquid Level Controls
- Bulletin ITC—on Ice Thickness Controls
- Bulletin FN—on Non-Conductive Liquids

## Lumenite Automatic TIMING CONTROLS

Lumenite Timers are the simplest, sturdiest and longest life. Accurate to fractions of a second, they speed and make more accurate all types of timed production.

For Details ask for

- Bulletin LT—Standard Time Switches
- Bulletin CR—Cycle Repeating
- Bulletin PC—Program Clocks
- Bulletin R—Time Delay Relays
- Bulletin RMC—Auto. Reset Timers
- Bulletin ET—Electronic Timers

Electronic or Electric Controls and Timers designed for special service.

**Lumenite Electronic Company**

407 S. Dearborn St., Chicago 5, Illinois

When inquiring check CP 5936 opposite last page

## now- MEASURE, CONTROL LIQUID DENSITY

continuously and automatically with the

**PRINCO**

Since 1910

### Densitrol



Process industries will welcome the new DENSITROL—the precision instrument that gives a continuous reading of density in flowing liquids such as sugar syrups, brine, acids. DENSITROL electrical indicators or recorders can be located remote from the sampling chamber itself. If desired, DENSITROL can be linked with control mechanisms for automatic regulation. For information on temperature and pressure ranges, calibrations, and other specifics, request Bulletin W-3.

**PRECISION THERMOMETER & INSTRUMENT CO.**

1434 Brandywine Street, Philadelphia 30, Pa.

Makers of precision-built thermometers, barometers, hydrometers, gauges, indicators, mercury in glass thermo-regulators.

When inquiring check CP 5937 opposite last page

CHEMICAL PROCESSING

# Most versatile of all industrial fans

1020 to  
85000 CFM

12" to 60"  
SIZES

Mounts in  
any position



## PROPELLAIR TYPE "CD" DIRECT CONNECTED FAN

Use this heavy-duty fan for ventilation... to exhaust heat, dust, moisture, fumes and smoke. It's powerful, dependable, efficient. Use it in ductwork, hoods, roof ventilators, wall mountings or for air circulation and cooling. Engineered to move a lot of air at low cost.

### You get these important features:

- Cast aluminum airfoil propeller for greater efficiency
- Dependable R & M All-Weather Motor direct connected for long, trouble-free service
- Venturi entrance ring with tip seal to create efficient air flow
- Rugged steel motor support arms welded to entrance ring
- Explosion-proof and glass-insulated motors available
- Fan and motor covered by a single Robbins & Myers guarantee



Write for Bulletin 690-C



When inquiring check CP 5938 opposite last page  
MARCH, 1955

## MAINTENANCE

**Weight of only five oz  
distinguishes compact  
solenoid valve...**

requires no gaskets, features  
self-aligning needle valve

**Uses:** In solenoid valve applications where space conservation and low power consumption is a must.

**Features:** Compact valve is 2-5/8" in length, 1-3/8" in diameter, weighs only 5 ounces. No gaskets are used on unit; important parts are stainless steel and all parts are silver-brazed for rigidity. Unit contains synthetic rubber needle valve which is self-aligning and gives positive close-off at any pressure.

**Description:** This compact solenoid valve is leakproof up to 200 psi, operates in any position, and may be mounted quickly and easily without brackets. Models are available in 6-12-24v, DC, and 110-120v, AC, completely waterproof and for use in ambient temperatures from -65°F to +350°F.

Orifice sizes range from 1/16" diameter to 9/64" diameter, while inlet connection is 1/4" NPT and outlet 1/8" NPT. Valve is fast operating, over 1000 cy, requires extremely low current, has low temperature rise.

(Solenoid valve is product of Specialty Products Co., Inc., Dept. CP, 3725 Monitor Ave., Minneapolis 16, Minn. . . or for more information check CP 5939 on convenient Reader Service slip opposite last page.)

★ ★ ★

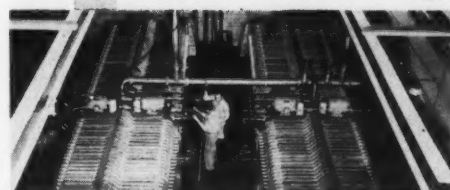
"THAT'S INTERESTING"

Dick Tracy comes to life

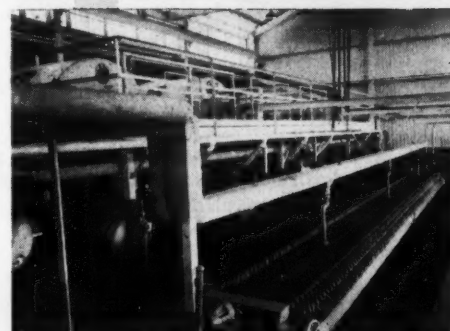
Straight from the comic strips is the Army's Signal Corps experimental "wrist-watch" radio receiver. The set utilizes a printed circuit and three transistors. It gives sharp reception at distances up to 45 miles. Use of transistors makes it possible to power the set with a very small battery (1/2 x 3/8") which is included in the wrist case. Earphone is like a small hearing aid and the antenna (one foot long) can be built into the wrist strap.

## Filter Presses Offer Many Variations to Improve Processing

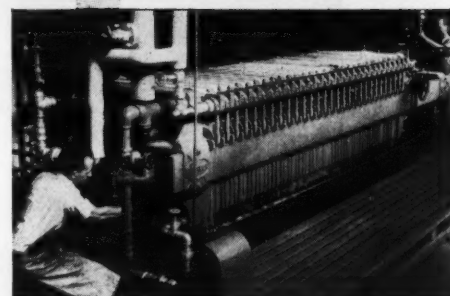
With Shriver filter presses it isn't a matter of just cake recovery or clarification. There are many operations that can be performed in a filter press or in some variation of the filter press design. Here are but three of many examples worth investigating.



These are Shriver brewery mash filters, each double-sectioned, with 40 chambers per section, which can be operated independently. Uniform, thorough extraction of the mash this way saves time, sparge water, labor, fuel and power and improves spent grains and produces drier, sweeter, more saleable filter cake.



This is not a filter press at all but a long, multiple chamber press for cooling and molding wax and similar substances into cakes of uniform size, weight and appearance, without shrinkage.



For versatility this steam heated Shriver Filter Press does about everything—filters, washes the cake, extracts all liquid, and melts the cake, all with the turn of a few valves.



There are many applications for Shriver Equipment in its multiplicity of designs, for cutting operating costs and producing better quality. The Shriver catalog tells how. Get a copy.

**T. SHRIVER & COMPANY, INC.**

846 Hamilton St., Harrison, N. J.

Filter Presses • Filter Media • Diaphragm Pumps

Marco Centrifugal Co.  
San Francisco 7, Calif.

Process Eng. & Equip. Co.  
St. Louis 19, Mo.

Sales Representatives  
The Watts Co.  
Houston, Tex.

Richardson Agencies, Ltd.  
Montreal, Que.

When inquiring check CP 5940 opposite last page

# Corrosion

## THE THIEF OF INDUSTRY

**Exacts a toll of  
8 Billion Dollars a Year**

... AND INDUSTRY PAYS OFF, despite the fact that Science and Research have developed hundreds of test proven protective coatings to meet any corrosion problem.



There are but three steps to adequate CORROSION CONTROL

### 1-ANALYSIS

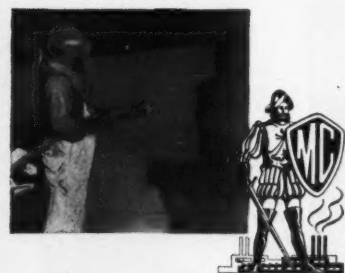
The condition must be analyzed by competent and experienced Corrosion Engineers highly skilled in Corrosion Survey and Research. A METAL-CLADDING Service.

### 2-SPECIFICATION

The result of such a survey will be the selection of a coating that will give Positive Protection against the particular corrosive action encountered. A METAL-CLADDING Service.

### 3-APPLICATION

The EFFECT then depends on proper application and surface treatment. Only CUSTOM APPLICATORS skilled in highly specialized techniques and equipment can assure the end result intended. A METAL-CLADDING Service.



Metal-Cladding Corrosion Control Service can reduce your maintenance costs, extend equipment life or protect product from contamination.

Write or phone us . . . LUDLOW 6205

**METAL-CLADDING, INC.**  
NORTH TONAWANDA, N. Y.

*Corrosion Engineering*

ANALYSIS  
SPECIFICATION  
APPLICATION

When inquiring check CP 5941  
opposite last page

## ENGINEERING AND MAINTENANCE

**"Is it dirt or is it mildew?" —  
simple chemical test tells**

A simple chemical test for painted surfaces provides an on-the-job answer to the question: "Is it dirt or is it mildew?" Rated 96% accurate, method will in most cases save the time previously needed for laboratory diagnosis of paint chips.

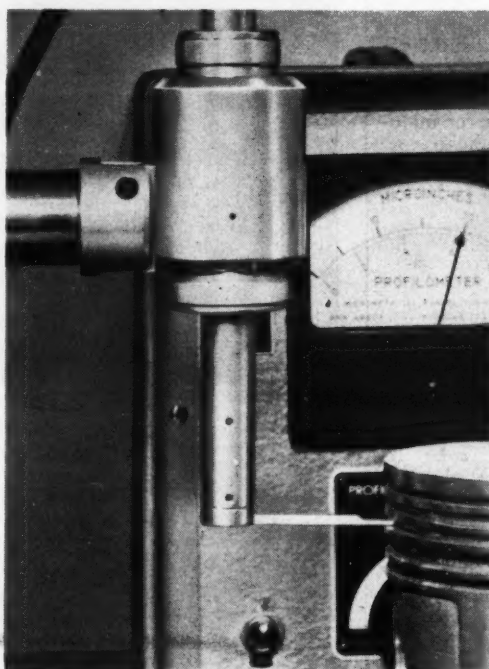
Pocket-size kits for mildew determination operate on a bleach principle. To use, apply bleach solution to suspected area, blot, and flush with water. If area remains dark, it indicates inanimate dirt, chemical, or other staining. If bleaching occurs, mildew is present.

Mildewtest Kit is available from Nuodex Products Co., Div. of Heyden Chemical Corp., Dept. CP, 1 Virginia St., Newark, N.J. When inquiring specify CP 5942 on handy form opposite last page.

**Takes surface roughness measure  
in small holes, narrow grooves,  
and slots . . .**

tracer point is at end of long, narrow beam permitting entrance into small openings

**Uses:** Taking surface roughness measurements in small holes, narrow grooves and slots, and on small parts, particularly where dimensions involved are less than 1/4".



Tracer measures in 5/64" holes to a depth of 1/4"

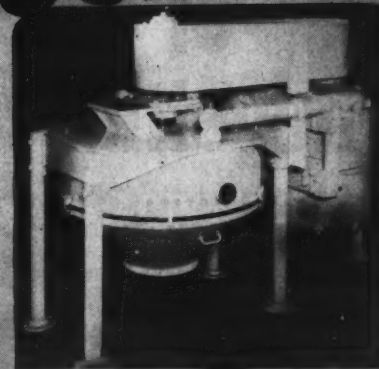
# PARTICLE SIZE REDUCTION!

High Productivity Rates per  
HP expended . . .

Narrow Particle Size Range . . .

Minimum Product Heating . . .

Capacity . . . up to 10,000 pounds  
per hour or higher on friable  
materials.



Belt Drive "ENTOLETER" Impact Mill  
equipped with 25 HP motor.

We shall be glad to process samples of  
your product on the "ENTOLETER"  
Impact Mill in our laboratory.

The trademark "ENTO-  
LETER" is your guarantee  
of complete satisfaction.

**ENTOLETER DIVISION**  
The Safety Car Heating and Lighting Company, Inc.  
1183 Dixwell Ave.—New Haven 4, Conn.

When inquiring check CP 5943 opposite last page

## Corrosion engineers specify low-cost easy to fabricate **BART Lectro-Clad** steel pipe and sheet

In every industry faced with corrosion and contamination problems, Bart LECTRO-CLAD steel pipe, plate, sheet and fittings offer an economical, yet highly satisfactory and long-lasting solution. The ductile, adherent and pore-free electroplated nickel surface will withstand any fabricating process that the low carbon steel itself will withstand.

For low cost protection in all types of equipment for chemical, petroleum, pulp and paper and other process industries, specify Bart LECTRO-CLAD products.

Sheet of LECTRO-CLAD sheet steel being rolled, to fabricate industrial process equipment. The material can be welded, flame cut, die formed or sheared without difficulty, and will withstand high temperatures without separating.

Complete information and technical data on all sizes of steel pipe, sheet and fittings, LECTRO-CLAD with up to .015" of pure nickel, available on request.



**BART MANUFACTURING CORP.**

209 Main Street • Belleville 9, New Jersey



When inquiring check CP 5944 opposite last page

CHEMICAL PROCESSING

**Features:** To permit entering small openings, this tracer has no skids and tracer point is at end of a long, narrow beam. Construction requires that tracer be supported and moved mechanically.

**Description:** Tracer, designated Profilometer Type GK, measures in  $5/64$ " holes and  $5/32$ " slots to a depth of  $1/4$ " and in  $1/8$ " holes and slots to a depth of  $1-3/8$ ". It is also used for measuring on gear teeth as small as 18 D.P., and on internal and external tapered surfaces, flats, and OD's where part can be mounted with work surface approximately horizontal.

(Surface roughness measuring instrument is a product of Micrometrical Manufacturing Company, Dept. CP, 345 S. Main St., Ann Arbor, Mich. . . . or for more information check CP 5945 opposite last page.)

**Excellent thermal conduction  
permits cement to be used  
for steam tracing . . .**

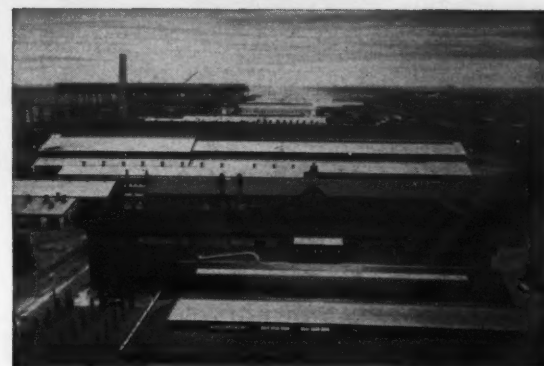
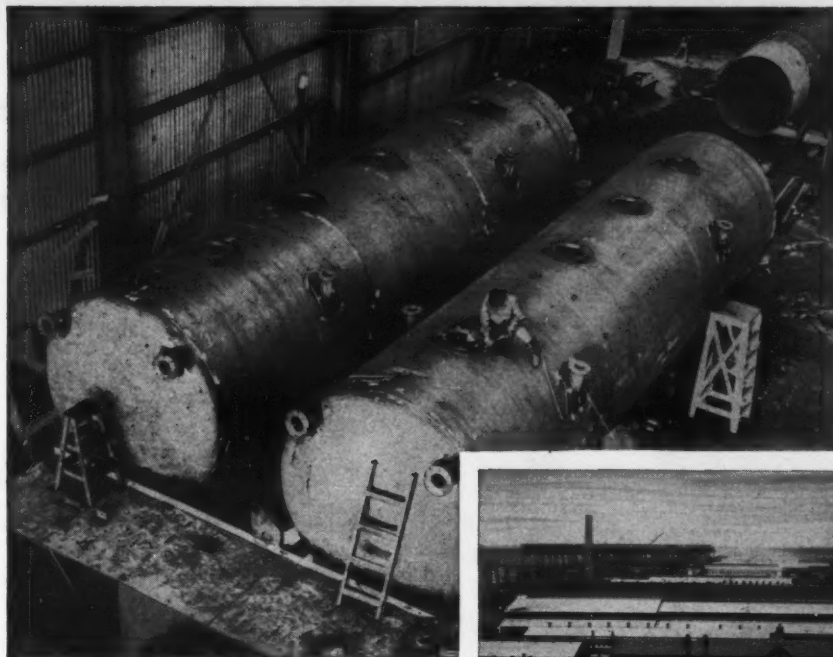
material adheres well, is resistant to thermal and mechanical shock, and is economical

**Uses:** Conducting heat between surfaces, usually irregular in shape. Material is said to have applications for improving effectiveness of steam-tracing for valves and pipes so that jacketing may be eliminated in many cases. It can also be used to make intricate molds that require fast conductivity of heat from interior to surface of mold.

**Features:** In its application over traced pipe, valves, or equipment where it is desirable to maintain a constant temperature by addition or subtraction of heat, cement can be used as an alternate to more expensive method of jacketing. For instance, in applications on  $1-11/2$ " stainless steel valve, with tracing tube for steam, Dowtherm, hot or cold water, cement is said to cost less than \$15 applied. This results in considerable savings and heating characteristics are comparable.

**Description:** Heat transfer cement, called Tracit, is a mortar-like material which is self-hardening and when set, is highly resistant to mechanical and thermal shock. It is easily applied to surfaces by hand or with a trowel. After setting by drying, either in air or forced drying, material bonds strongly to surface. Putty-like material can be formed around valves, pumps, or other irregular shapes, so that standard insulation can be applied. Linear shrinkage is less than 1% if material is applied to a metal surface. Shrinkage is 4.4% when material is not attached to any surface.

(Heat transfer cement is a product of Chemax Manufacturing Corporation, Dept. CP, 900 Wilmington Road, New Castle, Delaware . . . or for more information check CP 5946 on handy form opposite last page.)



**A Mile of Shops** — Each shop is devoted to a special type of heavy production. Included are complete Machine Shops, casting, forging and other facilities which offer all of the advantages of the execution of the complete job.

## A half mile of pressure vessels

These are two of seventy — over  $1/2$  mile — of  $38\frac{1}{2}$ -foot vacuum tank casings built to meet the quality requirements of a well-known chemical maker.

The buyer also benefits from many savings made possible by Newport News extensive heavy fabrication equipment and the sixty years experience in using it.

Do you plan installations of heavy production equipment? You can command the services of Newport News for weldments of

corrosion-resistant, alloy and clad metals in almost any size or shape, plus the required engineering background and complete welding and stress-relieving skills.

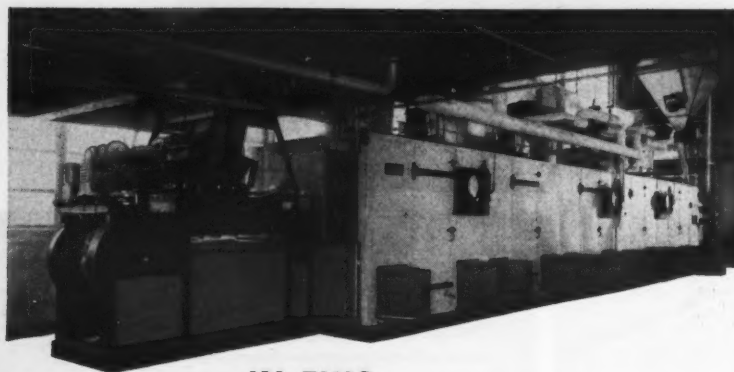
It will pay you to get the facts, shown in *Facilities and Products*. As you glance at its photos and brief captions, you'll see why Newport News can turn out — at low cost — specialized heavy equipment for chemical plants.

Send for *Facilities and Products* — free — today.

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Shipbuilding and Dry Dock Company  
Newport News, Virginia**

When inquiring check CP 5947 opposite last page

## Picture YOUR PRODUCT



### IN THIS PROCTOR CONTINUOUS DRYING RANGE

To improve your product call on Proctor & Schwartz, Inc., who not only manufacture drying equipment, but have the know-how to help you in materials handling problems which arise both in feeding the dryer and delivering your product to subsequent processing equipment.



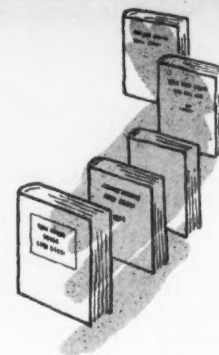
PROCTOR & SCHWARTZ, INC.  
7th STREET & TABOR ROAD, PHILA., PA.

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☐ HAVE YOUR ENGINEER CONTACT US.

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When inquiring check CP 5948 opposite last page

## Recent Books



### Statistical Analysis in Chemistry and the Chemical Industry

Reviewed by DAVID B. DUNCAN  
Professor of Statistics  
Virginia Polytechnic Institute

This book of 724 pages is the result of a decision by the National Research Council Committee on applied statistics to direct the preparation of a "comprehensive book on applied mathematical statistics with illustrative examples from chemistry and the chemical industry." Two authors, Dr. Carl A. Bennett, an American mathematical statistician, and Dr. Norman L. Franklin, an English chemical engineer, were co-opted for the project and worked together in the Statistical Research Group at the University of Princeton. Financial support was provided by the Office of Naval Research.

The authors have done an excellent job in achieving the objectives of the Committee. For a reader new to the subject, the exposition lacks some of the fullness of detail needed for easy assimilation. However, the development starts from the beginning level and gives a remarkably clear, economical, and wide coverage of relevant theory, analytical methods, and computational procedures. The first five chapters develop basic principles of statistical inference. These include a concise treatment of descriptive statistics, and fairly comprehensive chapters on probability and sampling, mathematical distribution theory, and statistical inference. The remaining six chapters deal with methods and theoretical topics chosen for their importance in industrial application. These include regression and correlation, analysis of variance, design of experiments, analysis of count data, control charts, and tests of randomness. The development, especially in the first part, goes beyond that of any other book on statistical analysis for chemists.

The style and choice of notation are good. The book is highly recommended to research

workers requiring a comprehensive set of modern statistical methods together with sufficient theory to understand their development and application.

To obtain "Statistical Analysis in Chemistry and the Chemical Industry" remit \$8 direct to John Wiley and Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. Specify CP 5949 on handy form opposite last page.

### Engineering Electronics

(Staff Review)

This text was written as a first book in electronics for engineering students. It therefore makes a convenient reference for plant instrument men who want to learn basic electronic principles for maintenance and design of electronic instruments.

Four full chapters are devoted to electron tubes themselves with descriptive explanations of what makes them work. Chapter by chapter, following these first four, this work takes up various classes of electronic devices. Typical chapter headings: Voltage amplifiers, Audio-frequency power amplifiers, Feedback amplifiers, Oscillators, Photoelectric cells.

While detailed mathematical treatment is provided in nearly all cases, there is enough lucid description to enable any practical worker with a fair knowledge of electricity to find answers to his questions.

On the negative side, it does not provide practical "hints and kinks" so necessary in making even well-designed electronic equipment work.

To obtain "Engineering Electronics" by Happell and Hesselberth (458 illustrations, 508 pages) remit \$7.50 direct to McGraw-Hill Book Company, Inc., 330 W. 42nd Street, New York 36, N. Y.

reviews of current technical and reference works  
... summarized for you by authorities in the field  
working with the CP staff

### Guide for Safety in the Chemical Laboratory

Reviewed by EDWARD G. SIMPSON  
Dublin, Virginia

The Safety Committee of the Manufacturing Chemists' Association has done an excellent job in presenting this most important subject in a tersely written manual.

The book opens with general rules for laboratory safety, an outline of a typical safety organization used in the chemical industry, and a discussion of the responsibilities of management, supervision, and the workers. A chapter dealing with laboratory design and equipment follows. In this the common fundamentals of construction and layout for safe, efficient operation are covered. The handling of glassware, probably the cause of most minor injuries in the laboratory, is given detailed coverage.

The chapter on flammability contains a table of over seven hundred chemicals, giving the flash point, ignition temperature, explosive limits, specific gravity, vapor density, boiling point, Underwriters' Laboratory's classification, and extinguishing agents. Preceding this table is an explanation of each of the classifications. There is also a short discussion on dusts and the prevention of dust explosions.

The definite laboratory hazards are taken up in the following order, with a chapter assigned to each: chemicals, toxicity, radiation, and pressure vessels. Under the chemical and toxicity hazards each of the more widely used chemicals is discussed, with the proper method of handling. The concluding chapters of the book discuss clothing, personal protective equipment, laboratory first aid, and the packaging and transportation of chemicals. There are references to and a listing of various chemical safety data sheets issued by the Manufacturing Chemists' Association and various manuals of standard and recommended practice.

In addition to its need in the established chemical laboratory, this book could be used to great advantage as a supplement to any good first-year general chemistry text.

To obtain "Guide for Safety in the Chemical

Laboratory" remit \$4.25 direct to D. Van Nostrand, Inc., Dept. CP, 250 Fourth Ave., New York 10, N. Y. When inquiring specify CP 5950 on handy form which is located opposite last page.

### The Technical Report

(Staff Review)

Technical reports are written to be read and good presentation is an inducement to read. With this in mind, the editor of this book has kept his material limited to practical and usable information.

To enhance the usable quality, the editor has selected as authors of the various sections men associated with some of the largest and best known industrial and educational institutions. A representative group of the various authors includes A. L. Fox of Colgate-Palmolive Co., D. S. Davis of Virginia Polytechnic Institute, B. H. Weil of Ethyl Corp. (General Editor of Book), L. C. Stork of American Petroleum Institute and R. S. Casey of Sheaffer Pen Co.

Although all aspects of writing the report are covered, perhaps the most valuable sections are those covering fundamentals of editing, illustrating, duplicating, binding, distribution, etc. It is fundamentally a how-to-do-it presentation. Reproductive techniques available to the technical report writer are up to date.

A study of the various chapter headings gives a good idea of the comprehensiveness of the book. Some samples of the subjects treated are: Writing the Technical Progress Report, Illustrating, Duplicating, Binding the Technical Report, Report Indexing by Hand-Sorted Punched Cards, and How to Locate and Obtain Government Information Reports. There is both a subject and author index as well as an appendix. Appendix I is especially valuable. It is a reproduction in full of the Report Manual of the Georgia Tech Engineering Experiment Station.

To obtain "The Technical Report," remit \$12 direct to Reinhold Publishing Corp., Dept. CP, 430 Park Ave., New York 22.

(Continued on next page)

## "NETONE" Filter Paper

- HIGH TENSILE STRENGTH
- HIGH BURST FACTOR
- ABRASION RESISTANT
- CREASE RESISTANT
- CHEMICAL RESISTANT

"NETONE" Filter Paper is a neoprene impregnated kraft paper that offers decided mechanical and chemical advantages over standard filter papers.

When compared to 60-pound unbleached kraft "NETONE" Filter Paper shows a 500% increase in wet tensile strength, wet burst factor increases from 6 to 57 and there is a marked increase in abrasion and crease resistance.

The following are a few test results indicating comparative resistance factors.

| Solution         | 60-Pound Kraft | Wet Strength Resin | Neoprene Treated (3%) |
|------------------|----------------|--------------------|-----------------------|
| H <sub>2</sub> O | 0              | 72 hr.             | 86 hr.                |
| 10% HCL          | 0              | 6 min.             | 4 hr.                 |
| 10% NaOH         | 0              | 6 hr.              | 72 hr.                |

Write us about your requirements and we will be glad to send samples for your testing.

... And for your filter cloth requirements we weave fabrics of VINCEL\*, Saran, Nylon, ORLON\*\*, Glass, VINYON N†, TEFLON††, DACRON\*\*\* and Polyethylene. Samples sent on request.

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\*\* TM for Du Pont acrylic fiber  
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When inquiring check CP 5951 opposite last page



Continuous sheet of sticky, dewatered hydrogel, neatly lifted from filter drum at top right, is carried by strings to discharge roll, falls to conveyor.

## YOU CAN PUT ALMOST ANY FILTER CAKE ON **FEinc** STRINGS

The FEinc String Discharge Filter . . . the original rotary vacuum string filter . . . easily handles thin soupy slimes, heavy sludges, coarse granules or fibres, sticky gels . . . almost any type of cake. The strings pick the cloth clean. The cloth does not smear and plug . . . you get more filtration per foot with FEinc. Blow-back is completely unnecessary, hence there's no wire winding. There's no scraping wear, hence cloths last two to five times longer. Cloth changing takes less time, too. The strings actually help. String life is excellent.

These are just a few of the reasons why, in a surprising number of cases, this FEinc is the most economical of all filters for the "easy" jobs as well as the tough ones.

The string filter is only one of many types of continuous filters now made by FEinc . . . backed by 35 years of experience . . . with proved ability to deliver tailor-made filters at no more than standard costs. Write or phone for details.



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When inquiring check CP 5952 opposite last page

## RECENT BOOKS

(Continued from preceding page)

### Soap Manufacture

(Staff Review)

Soap has been known for at least 2300 years, but theoretical principles of the art of soapmaking have only been formulated during the last hundred years. Practical soapmaking has been influenced by these principles for about the last three decades. New manufacturing processes have been developed, new raw materials and builders have been introduced, and synthetic detergents have become an important factor in the industry. Authors A. Davidsohn, E. J. Better, and J. Davidsohn, have prepared a much-needed, comprehensive treatise.

First volume of their two-volume work, "Soap Manufacture", has been published. Easy-to-read, it consists of 525 pages. Theoretical principles of soapmaking are covered in the first six chapters. Included are saponification, structure, phase behavior, and influence of physical and chemical properties on soap processes. All told, this section gives the reader an excellent foundation for understanding practical soap processes described in subsequent chapters.

Ten chapters are devoted to raw materials used in manufacturing. Covered are alkalis, inorganic and organic soap builders, bleaching agents, and fats and oils. An individual chapter on fatty acids describes various methods of splitting, fractionating, crystallizing.

Manufacturing processes are classified into three groups — cold-made, half-boiled, and full-boiled. Different methods in use today are discussed in detail. Good use is made of tables, flow diagrams, line drawings, and graphs.

Last three chapters are devoted to special soaps. Liquid transparent, shaving, shampoo, and medicated soaps are given full treatment. Ideal for reference purposes, the work should make a valuable addition in any library.

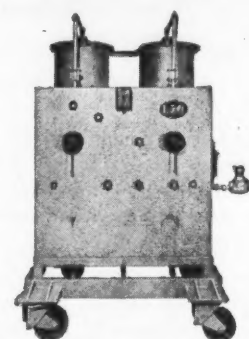
To obtain "Soap Manufacture, Volume 1" remit \$12.50 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Avenue, New York 1, N. Y. When inquiring specify CP 5953 opposite last page.

### Solvents Manual

(Staff Review)

Detailed information on the properties of about 230 organic solvents has been compiled in this symposium of 430 pages. Editor Cyril Marsden has listed for each solvent its physical characteristics and properties, industrial specifications of both American and British grades, azeotropes (if any), toxicity data, storage and handling information, and manufacturers in USA and Britain.

**ILLCO-WAY**  
**ionXchange**



## DE-IONIZER ON WHEELS

With this new unit, you can do your de-ionizing wherever you want to, because the "wagon" is completely self-contained and fully portable. We have made a number of similar arrangements for various specific purposes (such as the recovery of chromic acid from each of a string of plating tanks) but this is a general-purpose unit, primarily for the demineralization of water, but adaptable to other uses as well. It is available in either Two-Bed or Mixed Bed models.

### PROVIDES DE-IONIZED WATER WHERE AND WHEN YOU WANT IT

Operation is simple. You pull the unit right up to the most convenient location, hook up inlet and outlet hoses or pipes, run the process as long as needed, disconnect the unit, and haul it away to the next job. Regeneration is accomplished at some central point where a drain is handy and regenerant can be stored. If something like this has a place in your plant, please write for further details.

ILLINOIS WATER TREATMENT CO.

**ionXchange**



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ROCKFORD,  
ILLINOIS

NEW YORK OFFICE: 141 E. 44TH ST., NEW YORK 17, N. Y.  
CANADIAN DIST. PUMPS & SOFTENERS, LTD. LONDON, ONT.

When inquiring check CP 5954 opposite last page

CHEMICAL PROCESSING

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A comprehensive listing of trade names is included, but it would have helped if the specific manufacturer were given. Since the book is published in Great Britain, British trade names predominate.

A 22" x 35" chart is included with the book. This presents a quick reference to the actions of about 250 organic solvents on some 150 of the more important solutes.

To obtain "Solvents Manual" remit \$12.95 direct to The Elsevier Press, Dept. CP, 402 Lovett Boulevard, Houston 6, Texas. When inquiring specify CP 5955 on handy form opposite last page.

### Synthetic Rubber

Reviewed by J. REID SHELTON  
Professor of Organic Chemistry  
Case Institute of Technology

This comprehensive 1044-page survey of synthetic rubber, prepared under the auspices of the Division of Rubber Chemistry of the American Chemical Society, covers the decade starting with the emergency of the Second World War in 1941-1942, and culminating in the present-day synthetic rubber industry. A historical review of earlier work is included, and an attempt has been made to include references up to the publication date. The reader should realize, however, that the preparation of a book of this type and magnitude requires considerable time, and that an inevitable lapse of a few years occurs between the date of the original writing and the final publication.

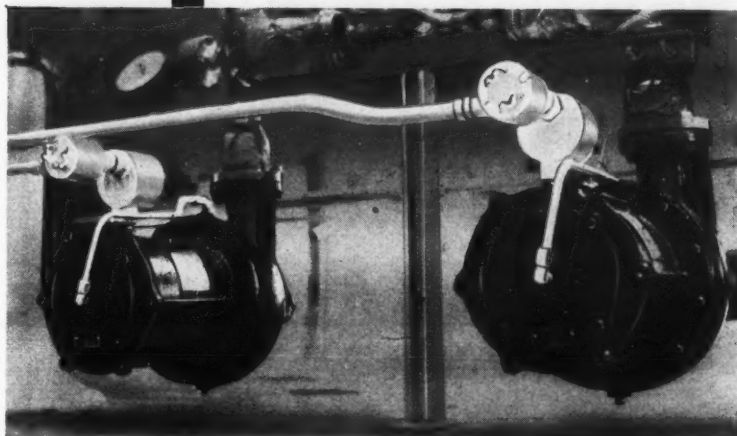
The book includes information on manufacture of raw materials, their conversion into various types of synthetic rubber, and the industrial utilization of the product. The editorial board and contributors include thirty-eight authorities who give a first-hand account of both scientific and technical developments. Comprehensive reviews in each chapter include numerous references to the original literature which may be consulted for more detail. The emphasis is more on practical technical aspects than on theoretical matters. A few of the chapters, notably Chapter 8 on emulsion polymerization, Chapter 9 on chemical study of structure, Chapter 10 on physical chemistry, and Chapter 13 on aging and stabilization of GR-S, give greater emphasis to scientific theory. Chapter 12 on physical test methods is particularly thorough in its coverage.

This book will be of considerable value for all persons interested in synthetic rubber research, testing, manufacturing, or use. It provides a convenient summary of existing knowledge up to the time of writing, and the comprehensive lists of references provide a useful guide to the original literature.

To obtain "Synthetic Rubber" remit \$18 direct to John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, New York. Specify CP 5956 opp. last pg.

# Chempump

handles problem fluids without  
failure or leakage of any kind...  
at large midwestern chemical plant



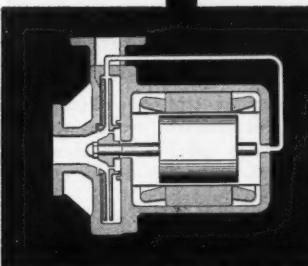
Two 2-hp. Chempumps on 0°F service, handling liquid which tends to polymerize on contact with air . . . thereby forming hard crystals which could cause operational trouble with ordinary pumps.

**PROOF** through performance is what sold this big chemical company on seal-less, leak-proof Chempump.

In one particular process, one man was kept busy just maintaining seals on small centrifugal pumps. When the Chempump was introduced, problem fluids were handled without failure or leakage of any kind. So far, maintenance has been no problem. The service these seal-less pumps have given is felt to more than justify the higher initial equipment outlay.

This is just another example of how Chempump has licked tough leakage problems! With this seal-less combined motor and pump unit, normally hard-to-handle fluids can't leak or become contaminated. Periodic inspection to indicate necessity of simple bearing change is the only maintenance required.

Your process can benefit through Chempump, too. For details, send for new 16-page Bulletin 1010. Chempump Corp., 1300 E. Mermaid Lane, Phila. 18, Pa. Engineering representatives in over 30 principal cities in the United States and Canada.



Chempump combines pump and motor in a single hermetic unit. Pumped fluid enters rotor chamber; no shaft sealing device required.

Approved by Underwriters' Laboratories. Available in wide choice of materials . . . from 1/4 to 7 1/2 hp. Capacities to 250 gpm. Heads to 195 feet.

Chempump can't leak!

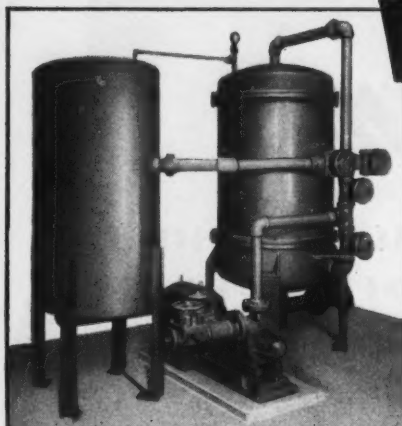
**Chempump —**  
first in the field . . . process-proved

Please send me details on Chempump for:

(application)  
Capacity \_\_\_\_\_ Total dynamic head \_\_\_\_\_  
Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 5957 opposite last page

## WAGNER BROTHERS FILTERS OFFER CHEMICAL PROCESSORS



### DOUBLE ECONOMY

LOW OPERATING COST • LOW MAINTENANCE COST

#### CONSIDER TWO FACTORS BEFORE YOU SPECIFY FILTERING EQUIPMENT:

- 1 The gallons of solution which can be efficiently filtered in a given period of time.
- 2 The cost of maintaining the filtering mechanism.

It's an established fact that Wagner Brothers Filters have a higher effective flow rate than any other equipment with equal filtration area . . . thus, gallon for gallon, it delivers more pure filtrate per hour at a lower unit cost. Sludge and other suspended matter (down to 1/10 micron) are removed when the

bath or solution is pumped through permanent membranes caked with a few cents worth of filter-aid (diatomaceous earth).

To clean, you simply turn a few valves and reverse the flow. Air bump backwash shocks the caked filter-aid from the membranes and through the sludge drain. Maintenance costs are reduced to 1/2 that of ordinary industrial filters since there is no messy replacement of bags, sheets or pads, no manual cleaning labor, no dismantling.

Standard models are available in capacities from 500 GPH up, filter areas from 3 to 100 square feet.

We design and build specials to suit your requirements. Write for detailed information and filtering questionnaire.

*Wagner*

**BROTHERS, INC.**

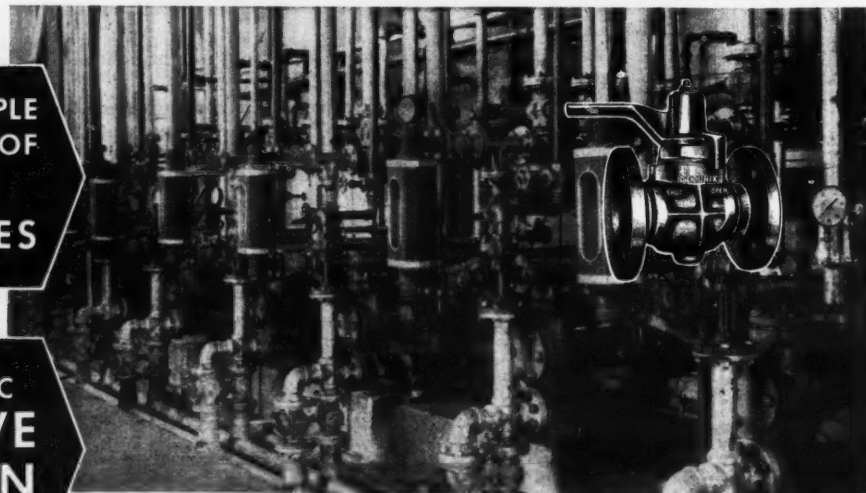
520 MIDLAND AVENUE • DETROIT 3, MICHIGAN

CHICAGO • ROCHESTER • CLEVELAND • CINCINNATI • INDIANAPOLIS • ST. LOUIS • NEW YORK

When inquiring check CP 5958 opposite last page

### ANOTHER MULTIPLE INSTALLATION OF DeZURIK PLUG VALVES

### FOR A SPECIFIC CORROSIVE SITUATION



ALUMINUM-BODY DeZURIK PLUG VALVES, with plug faces of special corrosive-resistant rubber compound, are key factors in this intricate processing system. They provide the ideal, trouble-free answer to a specific corrosive condition.

In the same system, on related non-corrosive lines, iron-bodied DeZurik Valves with rubber-faced plugs are employed. Here's one more case where there's a non-lubricated DeZurik Plug Valve that fits each specific job, with the easiest, most carefree operation attainable!

Write for bulletin or for recommendations to fit your valving problem:

**DeZURIK SHOWER CO. SARTELL, MINNESOTA**

When inquiring check CP 5959 opposite last page

## new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

#### Processed marine, vegetable oils and specialty vehicles listed

Complete line of processed marine and vegetable oils and specialty vehicles for paint, varnish, printing ink, floor coverings, and foundry industries is covered in this 40-page technical products booklet. In addition to descriptions and specifications of the products and suggested formulations, bulletin describes company's policies and top management.

Technical products book is available on direct letterhead request to Brown-Allen Chemicals, Inc., Dept. CP, P.O. Box 1, Port Richmond, Staten Island 2, N.Y.

#### Low-cost installation possible with submersible pumps

Bulletin of four pages describes and illustrates submersible turbine pump which can be installed at low cost since motor and pumping unit are completely assembled at factory. Units described are for wells 4" and 6" ID or larger and have capacities ranging from 10 to 121 gpm. Corrosion-resistant materials for operating completely submerged in well water are used in pump's construction.

Bul 6710-20 is available from The Deming Company, Dept. CP, 522 Broadway, Salem, Ohio. When inquiring specify CP 5960 on handy form opposite last page.

#### Pictures power trucks for hazard areas

Both manual and powered trucks and other material handling equipment for explosion hazard areas are shown in four-page bulletin. Explanation of what hazards can be overcome and means for designing safely are outlined.

Index No. 04.00 is issued by Revolver Co., Dept. CP, 8741 Tonnele Ave., North Bergen, N.J. When inquiring specify CP 5961 on handy form opposite last page.

### Greater heat transfer surface in sea-water condensers

Double-tube, counter-flow sea water condensers are covered in two-page illustrated bulletin. Designed for marine use or other "bad water" conditions, units are easy to clean, have cupro-nickel water tubes, and naval brass headers. Condensers are reported to have up to 50% more heat transfer surface than found in similar size standard fresh water condensers.

Literature includes charts which show water consumption versus inlet water temperature and pressure drop versus water flow. Complete specifications are also provided.

Bul C-4 is issued by Halstead & Mitchell, Dept. CP, Bessemer Bldg., Pittsburgh 22, Pa. When inquiring specify CP 5962 on form opposite last page.

### Guide to use of mastics as protective coatings

Illustrated discussion of various asphaltic mastic protective coatings available for use on masonry, brick, and concrete sidewalls is given in four-page report. Included is a chart listing mastic coatings designed to meet many industrial plant specifications and conditions of service. Steps to follow in selecting and applying mastics are summarized.

"Guide to the Use of Mastic Coatings" is available from Emjay Maintenance Engineers, Dept. CP, 327 Union Ave., Rutherford, N. J. When inquiring specify CP 5963 on handy form opposite last page.

### Revision of fire codes in new edition

Fire codes and standards are brought up to July, 1954 in a recent six-volume edition. Compilation includes 162 safety standards developed by NFPA.

Volumes I-V cover: Flammable liquids and gases (672 pages), Combustible solids, dusts, chemicals and explosives (512 pages), Building construction and equipment (640 pages), Extinguishing equipment (640 pages), and Electrical standards (672 pages). Volume VI appears for the first time. It covers transportation by truck, ship and plane in 424 pages.

To obtain any of these remit \$6.00 per volume direct to National Fire Protection Assn., Dept. CP, 60 Batterymarch St., Boston 10, Mass. When inquiring specify CP 5964 opposite last page.

unmask

the

thief

in

your

shop

Switch to disposable NEW KIMWIPES and get 4-10 times  
more wiper area per dollar!

Don't let expensive cloth and waste wipers rob you of profits. Replace them with Type 1300 Kimwipes — the modern industrial wipers that are so soft, strong, absorbent and economical, they make ordinary wipers obsolete! A full 12" x 18" in size, Kimwipes 1300 hold up to eight times their own weight in liquids.

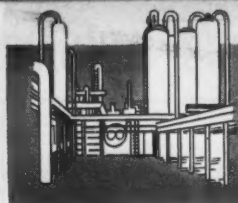
They're non-abrasive, too. There's no holdover of metal chips or other infectious material that may cause dermatitis (an infection that cost industry a loss of 2,500,000 man hours and a financial loss of nearly two million dollars last year). Type 1300 Kimwipes are absolutely clean to start with and are disposed of after use. Ask your salesman for a sample. And remember, you can also buy Type 900-S Kimwipes (optical wipers) and Type 900-L Kimwipes (precision wipers). Save money. Order today!



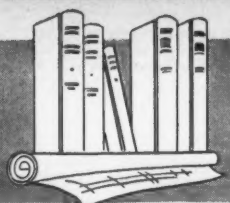
**Kimberly Clark**  
**Kimwipes**

Kimberly-Clark Corporation • Neenah, Wisconsin

When inquiring check CP 5965 opposite last page



## Processing and Engineering Data



112

### COST CONVERSION Weight Basis — Volume Basis

Courtesy of Bakelite Company  
A Division of Union Carbide and Carbon Corp.

Where material is bought by the pound and used by the cubic inch, as in plastic molding, cost estimates involve tedious conversion. This nomograph makes it possible to find cost per cubic inch directly from cost per pound and specific gravity.

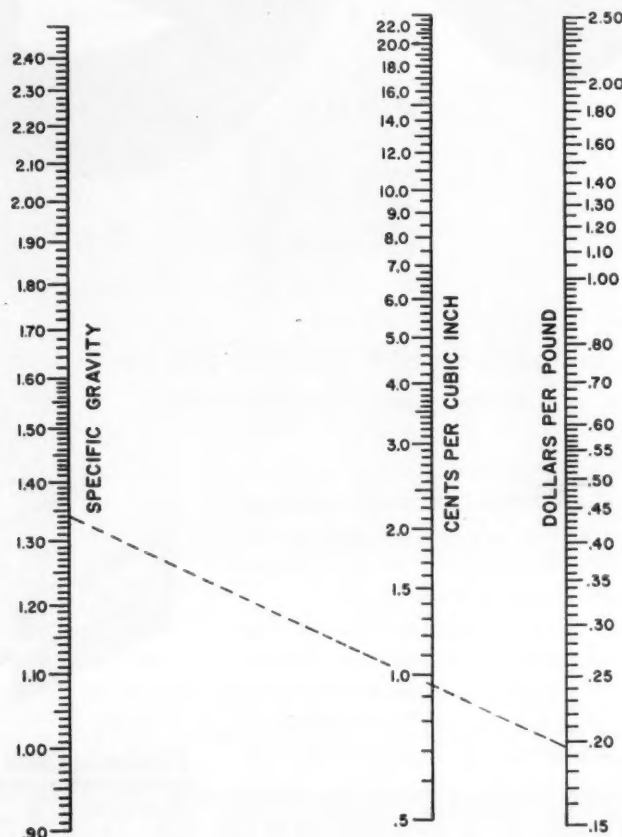
#### Typical Example

Material with a specific gravity as received of 1.34 and costing \$0.195 per pound is to be molded.

What is the material cost per cubic inch of molded plastic?

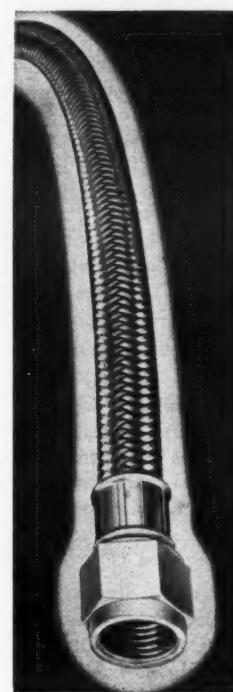
Connect 1.34 on specific gravity scale with 0.195 on dollars per pound scale. Read material cost as 0.94 cents per cubic inch.

NOTE: Estimates from nomograph differ slightly from calculated value. Nomograph is based on lab and plant tests.



Look at these advantages  
of high temperature

## TEFLON® Hose Assemblies



**FLUOROFLEX®-T** hose assemblies provide the advantages of Teflon in flexible hose form. More and more problems are being solved by this unique "flexible piping" which offers you:

- ▲ A chemically inert, non-swelling, non-aging Fluoroflex-T (Teflon Compound 1001) tube suitable for all fluid use.
- ▲ Vibration absorbency and flexibility that stay constant indefinitely from -100°F to +450°F.
- ▲ Corrosion resistant 304 stainless steel braid that reinforces for up to 1000 psi operation.
- ▲ Ease of handling with lightweight, space saving construction.
- ▲ Leakproof, 304 stainless fittings tightly swaged to armor and tube to prevent "blowout."

Write for Bulletin FH-1

### The right grade of TEFLON to meet your chemical and mechanical needs

"Non-porous grade" Fluoroflex-T—available in rods, tubes, sheets and fabricated parts—gives you the fine quality Teflon products you need for such uses as nozzles, seals, bearings, anti-adhesive surfacing. "Mechanical grade" delivers optimum chemical properties and improved resistance to elongation. Let us quote on your requirements.

©Teflon is the DuPont registered trademark for its tetrafluoroethylene resin. Fluoroflex is the Resistoflex registered trademark for products from fluorocarbon resins.

**RESISTOFLEX**  
CORPORATION  
Belleville 9, New Jersey

When inquiring check CP 5966 opposite last page

CHEMICAL PROCESSING

Offers  
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filters

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Bulle  
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Speci

MARCH

### Offers single volume guide to industrial medicine

Originally intended as a guide for Du Pont's own physicians, 414 page book presents information invaluable to physicians, executives, safety engineers and chemists. First chapters present data that permits plant managers and other industrial executives to evaluate adequacy and efficiency of their medical services and gives specific information on administration, functions, personnel, layout, equipment, etc.

Five chapters on industrial preventive medicine discuss such subjects as research, toxicological methods, plant surveys, protective clothing.

There are sections on effects of temperature, humidity, and air movement; industrial noise, radiological hazards, and fatigue. Other sections deal with psychiatry, toxicology, and problems of acute poisoning.

One section of 43 pages is devoted to Chemical Health Hazards. This contains a useful table listing of compounds and how they affect personnel.

Book should be especially useful to the small plant and new plant managers. It's a good "How-To" guide to industrial safety.

Modern Occupational Medicine is available by remitting \$10 direct to Lea & Febiger, Washington Square, Philadelphia 6, Pa. When inquiring specify CP 5967 opposite last page.

### Sequestering metallic ions in edible fats and oils

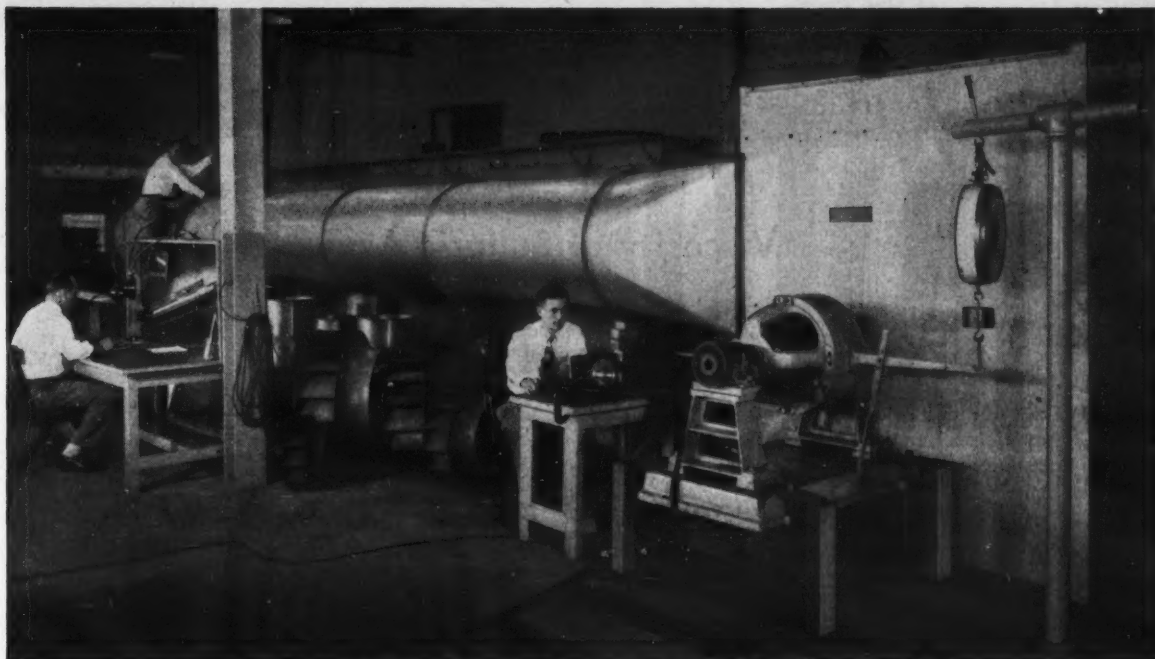
Citric acid and certain of its esters are used to inactivate iron, copper, and nickel ions in edible fats and oils. This complexing provides an edible oil product with improved stability.

Bul No. 72 is issued by Chemical Sales Div., Chas. Pfizer & Co., Inc., Dept. CP, 630 Flushing Ave., Brooklyn 6, N.Y. When inquiring specify CP 5968 on handy form opposite last page.

### Porous stainless steel filters described

Porous stainless steel filter elements are described in four-page bulletin. Photographs show elements, containers, and special headers. Bulletin discusses features, construction.

Bulletin 212 is issued by Micro Metallic Corporation, A Pall Filtration Company, Dept. CP, 30 Sea Cliff Avenue, Glen Cove, New York. Specify CP 5969 opposite last page.

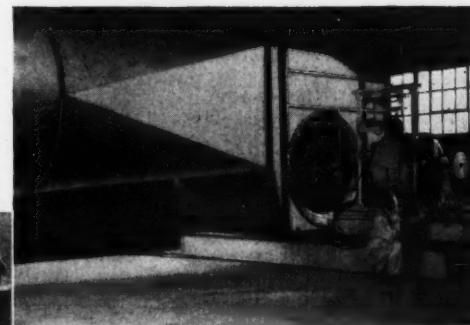


Testing fan wheel performance in the "Buffalo" Laboratory

## WHY "BUFFALO" FANS PERFORM\* AS SPECIFIED

What will this wheel design deliver at various static pressures? What are the horsepower requirements? Noise level? And what's the best housing? Endless testing like this in the "Buffalo" Laboratory—plus endless designing and redesigning—brought you the famous high-performance Type BL Limit-Load Ventilating Fan—and will continue to bring you the latest and finest in fans. You can expect this inbuilt performance whenever you order a "Buffalo" Centrifugal, axial flow or propeller fan.

WHERE WE TRY TO DESTROY WHEELS—the "Buffalo" vacuum test pit where wheels are revolved at many times their operating speeds to discover—and correct—any point of structural weakness. Further assurance of a better fan buy when you specify "Buffalo".



ALL TESTS in the complete "Buffalo" laboratory are conducted in strict accordance with the test code adopted jointly by NAFM and ASH&VE.

\*Performance—another term for the "Buffalo" "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.



### BUFFALO FORGE COMPANY

524 BROADWAY BUFFALO, N. Y.  
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.  
Sales Representatives in all Principal Cities

VENTILATING

AIR CLEANING  
FORCED DRAFT

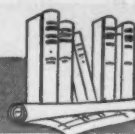
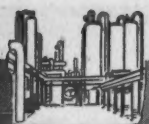
COOLING

AIR TEMPERING  
HEATING

INDUCED DRAFT  
PRESSURE BLOWING

EXHAUSTING

When inquiring check CP 5970 opposite last page



## Viscosity of Sulfuric Acid

BY D. S. DAVIS

Professor of Chemical Engineering  
Virginia Polytechnic Institute

Data that deal with viscosities of sulfuric acid of various concentrations over a wide range of temperature can be correlated by means of the expression —

$$\log \mu = a + b \log (t + 70)$$

where:

$\mu$  = viscosity

cp

$t$  = temperature

°C

$a, b$  are dependent on concentration of acid

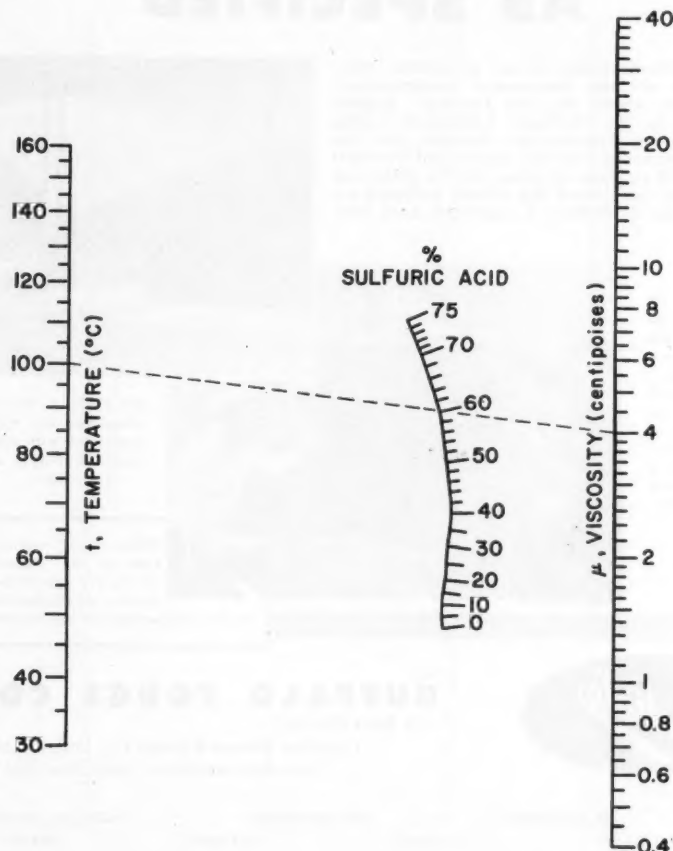
This equation is solved readily and accurately by means of accompanying chart. This nomograph was constructed by method described previously<sup>1</sup> from reliable data<sup>2</sup>.




### Typical Example

At 100°C what is the viscosity of 60 per cent sulfuric acid? Connect 100 on  $t$ -scale and 60 on percentage scale with a straight line. Read viscosity as 4.0 centipoises.

### LITERATURE CITED

- (1) DAVIS, D. S., "Empirical Equations and Nomography," Chap IX, McGraw-Hill Book Co., New York (1943)
- (2) STEARNS, R. F., JACKSON, R. M. JOHNSON, R. R. AND LARSON, C. A., "Flow Measurements with Orifice Meters," D. Van Nostrand Co., (1951)



It's a cinch  to clean any size  heat exchanger tube  the Wilson way!

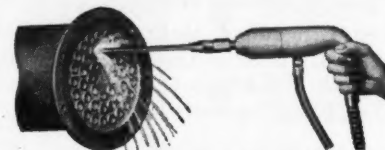
Why put up with the delays and the high costs of makeshift tube cleaning methods? Wilson has exactly the tube cleaner you need to do the job quickly, thoroughly, economically. Wilson's complete line of fast-acting tube cleaners includes the popular PG for  $\frac{3}{8}$ " to 1", the PGX for intermediate sizes  $\frac{1}{2}$ " to  $1\frac{1}{2}$ ", and the TP-301 for up to  $2\frac{7}{8}$ " ID.

### For Small Sizes MODEL PG PISTOL GRIP TUBE CLEANER



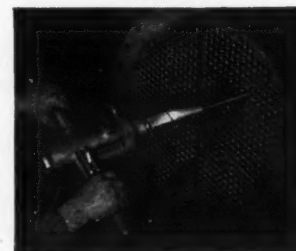
The fast, efficient Pistol Grip Tube Cleaner provides the operator with one-hand control for cleaning small, straight tubes. Weighs only 3 lbs.—no more than a 12" Stillson wrench.

### For Intermediate Sizes MODEL PGX TUBE CLEANER



Positive drive (not geared down) high speed, rotary shaft, air-driven scavenger type cleaner. Washes out tube and debris as it cleans, keeping drill bit cool at the same time. For either vertical or horizontal applications, straight or curved tubes.

### For Heavy-Duty Service MODEL TP-301 TUBE CLEANER



Suitable for vertical or horizontal use in straight or curved tubes  $\frac{3}{8}$ " ID to  $2\frac{7}{8}$ " ID and up to 40' long. Cleans rapidly, thoroughly, operating at high speed at 90 psi. Can run on pressure as low as 50 psi.

Representatives  
in all principal cities

WRITE FOR BULLETIN TW-829

Thomas C. Wilson, Inc., 21-11 44th Ave., Long Island City 1, N. Y.  
CABLE ADDRESS: "TUBECLEAN" NEW YORK

**WILSON**  
TUBE CLEANERS • TUBE EXPANDERS

When inquiring check CP 5971 opposite last page  
CHEMICAL PROCESSING

## NEW LITERATURE

### Packaged boiler specs presented in brochure

Information on operation and specifications of three models of package boilers built to meet steam requirements in medium pressure range, from 4100 to 30,000 lb steam an hour, are included in eight-page brochure. Units described burn gas or oil or combination of both.

Brochure WT-7 is issued by Wm. Bros Boiler and Mfg. Company, Dept. CP, 1057 Tenth Ave., S. E., Minneapolis 14, Minnesota. Specify CP 5972 opposite last page.

### Describes solenoid valves for pressures to 5000 psi

Illustrated, two-color bulletin of four pages illustrates features of bronze and stainless steel high-pressure solenoid valves.

Bul HP 201 is issued by Atkomatic Valve Co., Dept. H-136, Dept. CP, 545 Abbott St., Indianapolis 25. Ind. Specify CP 5973 opposite last page.

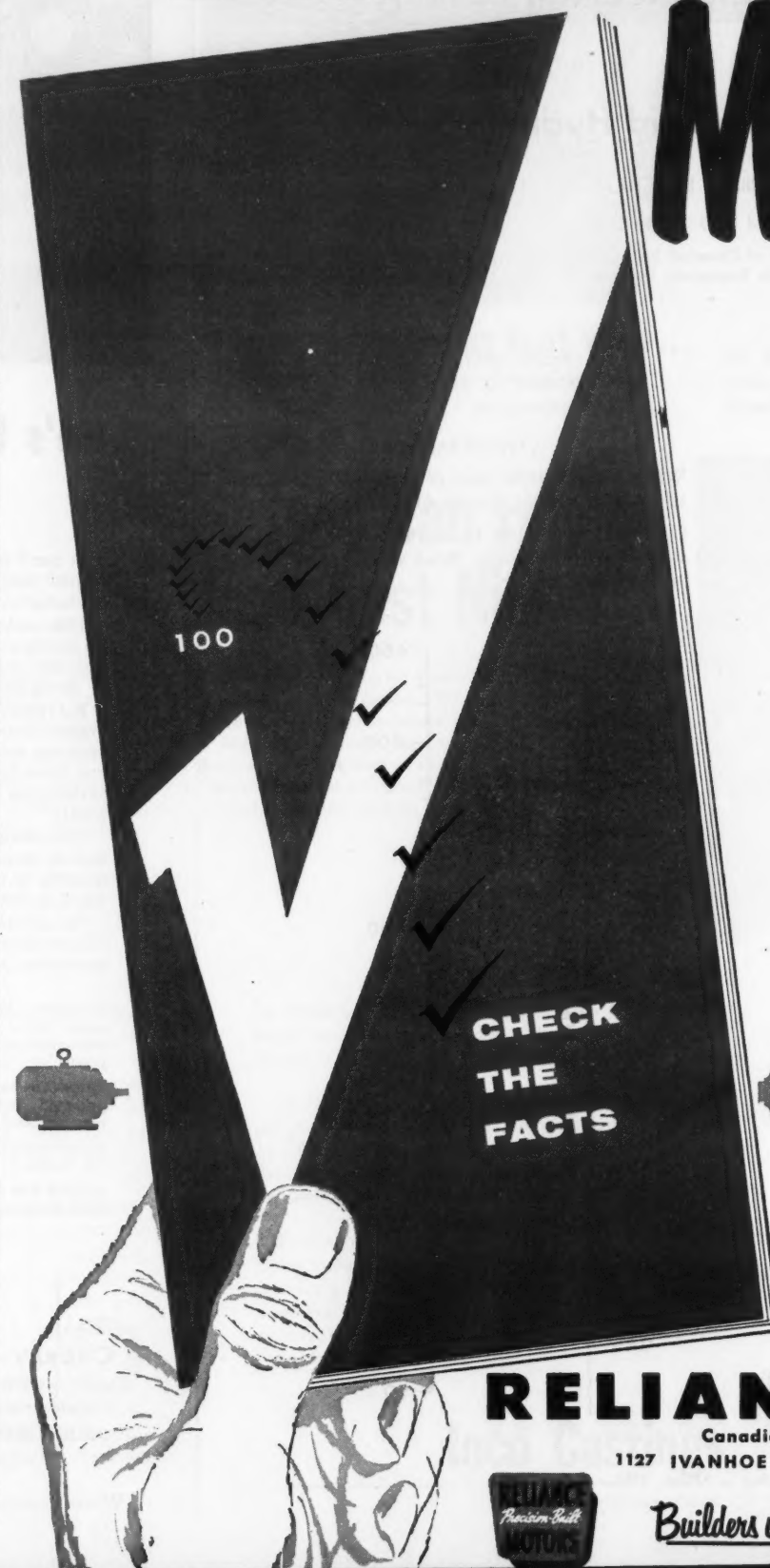
### How to package products told in bulletin

Ideas on how to package a variety of products are presented in 32-page bulletin. Described and illustrated are a selection of 12 styles and more than 70 types of corrugated boxes. Suggestions for sealing, packing, and displaying accompany descriptions.

"How To Pack It" is issued by Hinde & Dauch Paper Co., Dept. CP, 5103 Decatur St., Sandusky, Ohio. When inquiring specify CP 5974 on handy form opposite last page.

For more information on product at right, specify CP 5975 . . . see information request blank opposite last page. ➡

# NEW -----TOTALLY PROTECTED----- A-C. MOTORS



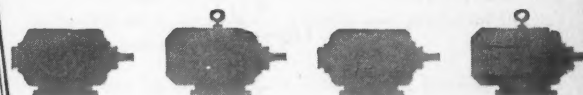
Yes, it's true!

Industry everywhere is checking into the facts about these amazing new *Totally Protected A-c.* Motors by Reliance.

To help you check the facts to see where it fits into your production area, we've prepared a booklet called "Check the Facts".

Get your copy today—by mail, or through your local Reliance district sales office or distributor.

B-1489



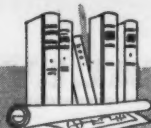
## RELIANCE ELECTRIC AND ENGINEERING CO.

Canadian Division: Welland, Ontario  
1127 IVANHOE ROAD • CLEVELAND 10, OHIO



*Builders of the Tools of Automation*





## Specific Heats of Liquid Hydrocarbons

By HERBERT L. SCHAAF

Edited by D. S. DAVIS

Professor of Chemical Engineering  
Virginia Polytechnic Institute

Specific heats of liquid hydrocarbons (both in cal/gm°C and Btu/lb°F) are related to temperature and specific gravity by this nomograph. It is based on the equation —

$$C_p = 0.5 \delta^{-0.5} + 3.891 \times 10^{-4} - 0.0229$$

where:

$C_p$  = specific heat

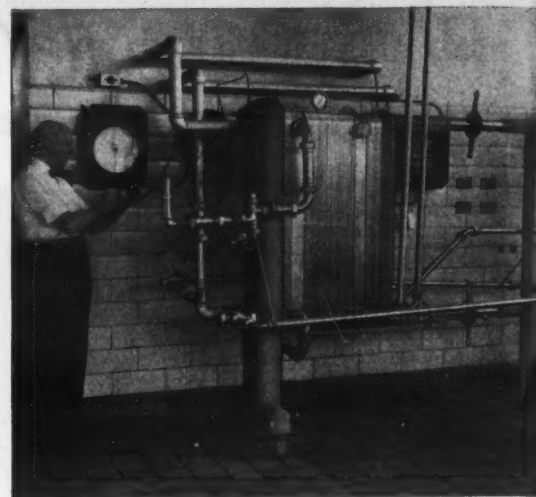
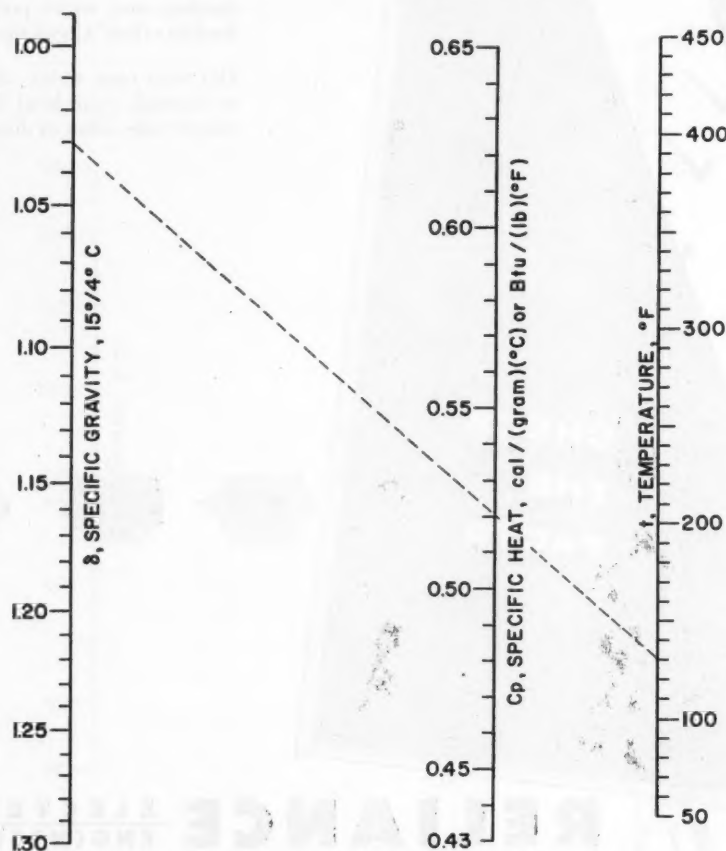
cal/gm°C or  
Btu/lb°F

$\delta$  = specific gravity at 15°C  
relative to water at 4°C  
 $t$  = temperature °F

### Typical Example

What is the specific heat of a liquid hydrocarbon at 130°F if specific gravity (15°/4°) is 1.03?

Connect 130 on the  $t$ -scale with 1.03 on the  $\delta$ -scale by a straightedge. Read specific heat as 0.52 cal/gm°C or Btu/lb°F.



## He's keeping tabs... on what!

You can't tell from this photo what's going on inside this Cherry-Burrell "Superplate" heat exchanger.

This versatile plate-type heat exchanger could be heating . . . cooling . . . regenerating . . . or Shorttime pasteurizing an almost endless variety of liquid products.

But regardless of product, "Superplate" assures higher heat transfer rates. The electropolished stainless steel plates in this totally enclosed circuit have from 2 to 5 times more heat exchange surface per pound of product than tubular equipment.

And since "Superplate" during cooling transfers as much as 80% of a product's heat units directly to another product being heated, your heating and cooling costs are substantially lower.

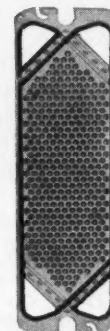
For all the cost- and space-saving facts about "Superplate," contact your Cherry-Burrell Representative. Or write for literature.

**Exclusive Electropolished Plates.** in either 304 or 316 stainless, give greater resistance to corrosion and product deposits.

**Three-Dimensional Turbulence** set up by patented knobbed design accelerates heat transfer with low pressure drop.

**Nonclogging Flow Space** between plates, full length.

**Largest Port Areas** of any plate for low fluid pressures.



### CHERRY-BURRELL CORPORATION

427 W. Randolph Street, Chicago 6, Ill.

Equipment and Supplies for Industrial and Food Processing

SALES & SERVICE IN 57 CITIES—U. S. AND CANADA

When inquiring check CP 5976 opposite last page

CHEMICAL PROCESSING

**Glass products for industry**

Company's line of glass products for industry is described in detail in 16-page catalog. Included are application data tables which cover dimensions, weights, wall thicknesses for glass tubing and rod, capillary tubes, low pressure gage glass tubes, oil cup glass cylinders, and glass wool fiber used in filtration processes.

Working tolerances are given for almost all products as well as dimensions of all glassware carried in stock.

Cat 53A is available from Friedrich and Dimmock, Inc., Dept. CP, Lincoln Avenue, Millville, N. J. When inquiring specify CP 5977 on handy form opposite last page.

**Charts, data help to select proper filter cloth**

Synthetic filter cloth is discussed in six-page folder. Dynel, Nylon, Orlon, polyethylene, Saran, and other materials are covered. As an aid to the proper selection of cloth for any application in filtration or dust collection, bulletin includes charts of chemical and temperature resistance, discussion of technical considerations, magnified views of various weaves, and performance case histories.

"Synthetic Filter Cloth" is issued by Filtration Fabrics Division, Filtration Engineers, Inc., Dept. CP, 155 Oraton Street, Newark 4, N. J. When inquiring specify CP 5978 opposite last page.

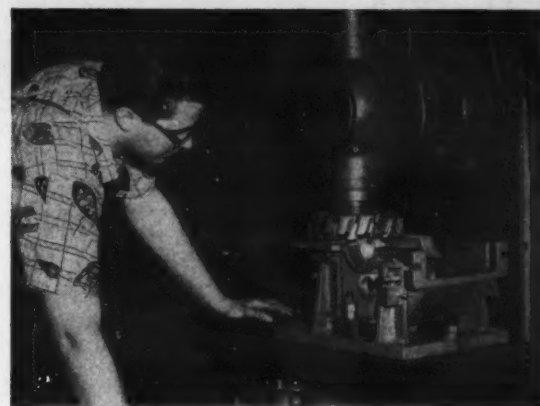
**Reactions, uses, properties of maleic anhydride**

Use of maleic anhydride in phthalic-type alkyd resins, in upgrading of drying oils, and in formation of hard resins and tall oil resins is described in detail in 20-page monograph. Step-by-step instructions for preparation of typical formulations are included. Also covered in detail are the Diels-Alder reactions of maleic anhydride, hydrogenation and inversion, unsaturated polyester resins for low-pressure lamination, and commercial applications of maleic anhydride derivatives. Specifications, physical constants, solubilities, and physiological effects are completely described by table and graph. The anhydride is supplied in fused and briquette form.

"Maleic Anhydride" is issued by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 12th & Delmar, St. Louis 4, Mo. When inquiring check CP 5979 on handy form opposite last page.

**Where product purity is at stake...**

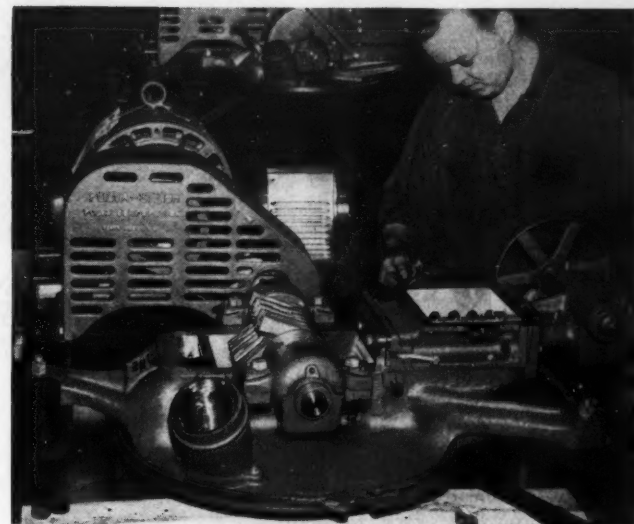
(as in processing color-sensitive plastics for products like these)

**where you need a tough casting...**

(for intricate parts like the saran pulverizer housing being milled above)

**...you can rely on Inco-Cast Nickel**

(Here, for example, Pulva Corporation is assembling another nickel PULVA-SIZER for processing saran. Previous units, generally operated on a 24-hour-a-day basis, have proved so reliable they have given more than a year of trouble-free service. Twelve Inco-Cast Nickel castings and five other Nickel parts are used in the assembly.)



In Inco-Cast Nickel you get both an enduring metal and a sound casting. That's why Inco-Cast Nickel is so useful in an application like this.

In Inco Nickel, you get a metal that will handle polyvinylidene chloride and its copolymers as well as other organics without staining them . . . a metal that doesn't tend to catalyze their decomposition at processing temperatures.

Furthermore, Inco Nickel is a tough, easy-to-machine metal with good all-around physical and mechanical properties . . . strength, corrosion resistance, wear resistance, good appearance. You can weld it readily by any of the standard welding processes using Inco welding materials.

Inco Nickel — cast by Inco — is your assurance of nickel castings that are sound, free of distortion, close as to tolerance, clean as a whistle, and produced in any practical size and shape.

You can be sure, too, of Inco's extra interest in and experience with its own metals . . . and of Inco's technical assistance.

So where product purity is at stake and you need a metal you can count on to last, put Inco-Cast Nickel high on your list. For complete information, write for Inco's new booklet, "Cast to Outlast."

**The International Nickel Company, Inc.**  
67 Wall Street  
New York 5, N. Y.

**Inco Castings . . . Sand, Centrifugal and Precision**

When inquiring check CP 5980 opposite last page





## SIZING HOPPERS

By ROBERT W. RUPPERT

Nomograph presented here is a fast way of dimensioning hoppers or of finding capacity of existing hoppers. It is based on an equation pertaining to pyramid and cone-shaped hoppers and it takes into account the truncation of the cone. Volume of hopper can be found by —

$$V = \frac{h}{3} (A_B + A_b + \sqrt{A_B A_b})$$

where:

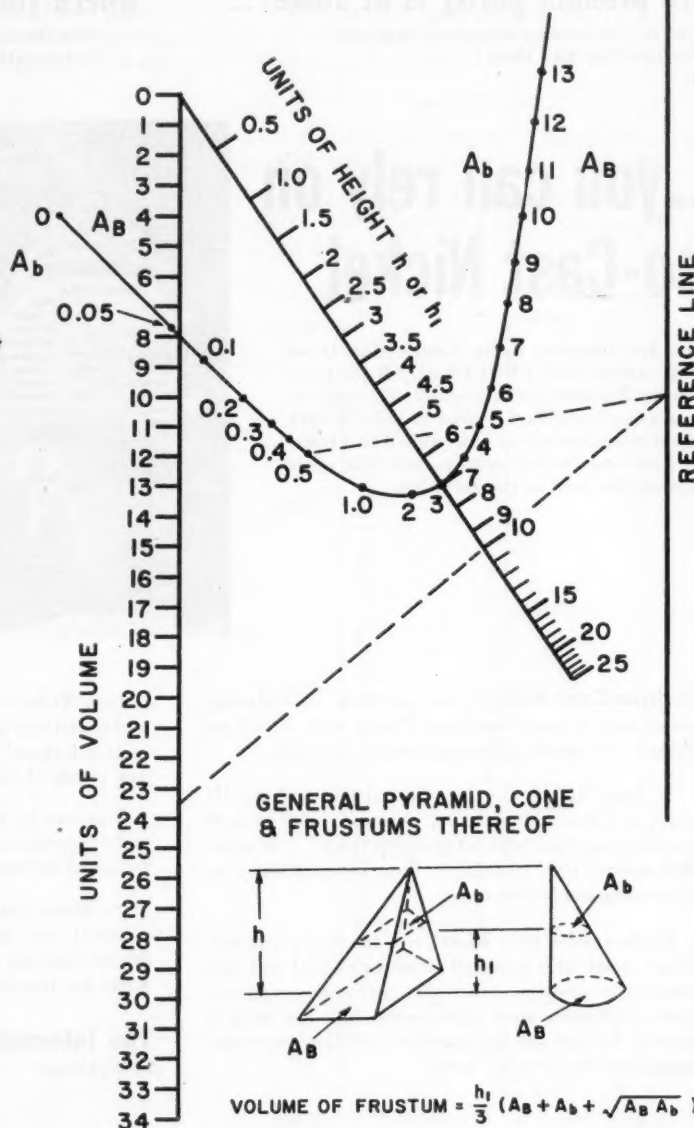
$V$  = volume  
 $h, h_1$  = height of cone or pyramid or (see sketch) height of frustum } any consistent units  
 $A_B$  = area of larger base  
 $A_b$  = area of smaller base

Nomograph can be used for full cones or pyramids by using a value of zero for the area of smaller base. Since units are unspecified, problems where solution falls offscale for feet, for example, can be converted to yards. Final solution, of course is converted back to desired units.

### Typical Example

A hopper 10 feet high is to be installed in a space allowing a top area of 5 sq ft. If this is to be a conical hopper with a bottom opening of 0.5 sq ft, what volume will it hold?

Lay straightedge through points 0.5 and 5 on  $A_b, A_B$ -scale. Locate intersection with reference line. Connect this intersection with 10 on  $h_1$ -scale and extend straightedge to volume scale. Note intersection at 23.6 — obviously 23.6 cubic feet in this case.



# agilene®

(POLYETHYLENE)

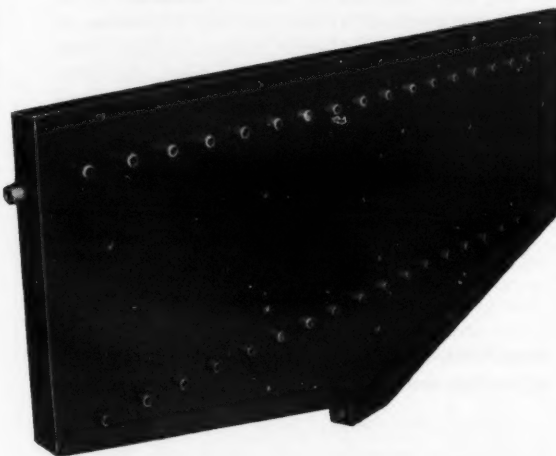


# agilide®

(NON-PLASTICIZED)  
(POLYVINYL CHLORIDE)

improved non-corrosive plastics for fabrication of chemical processing equipment

Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE — fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



Only AGILIDE would do the job! A very difficult corrosion problem in electrolytic refining of metal—a two temperature system with 30% sulfuric acid and 6% chromic acid up to 150° F. The AGILIDE tanks as pictured above have given complete satisfaction. Tank is 8 feet long, 4 feet high and 2½" wide of ½" thick material, tested and assured leak proof at our plant.

## American Agile Corporation

Plant and General Offices • 5441 Dunham Rd., Maple Heights, Ohio  
 Mailing Address: P. O. Box 188 • Seaford, Ohio

DEPT. C-1

When inquiring check CP 5981 opposite last page

CHEMICAL PROCESSING

**Line of solenoid, pilot valves  
detailed in bulletin**

Standard 4-way hand, foot, power, and solenoid valves and a line of pilot valves are covered in 16-page bulletin. Dimensions and weights, application and circuit diagrams, and accessories are also included.

Bul 1010 is issued by Ledeen Mfg. Co., Dept. CP, 1600 San Pedro St., Los Angeles 15, Calif. When inquiring specify CP 5982 on handy form opposite last page.

**No manual cleaning required  
with backwash filter**

Operation and function of pressure filter is described in four-page brochure. Complete with photographs, drawings, charts, and flow diagrams, bulletin explains advantages, design, and capacities of different models.

Filter operates on three-step principle of precoat-ing, filtering, and backwash cleaning. Backwash eliminates manual cleaning and disassembly for replacement of internal parts. Manufacturer's laboratory, pilot plant, and engineering services are also explained.

"The Clarite Filter" is issued by Croll-Reynolds Engineering Company, Inc., Dept. CP, 17 John Street, New York 38, New York. When inquiring specify CP 5983 on handy form which is located opposite last page.

**Details on alloy's resistance  
to specific corrosives**

Complete description of company's Number 20 and Number 20-Cb steels is contained in twenty-two page catalog. Both the basic Number 20 alloy and the columbium-stabilized analysis are sulphuric acid-resisting steels. Latest information is given on corrosion-resistance, applications, and working characteristics. Several pages record in detail the resistance to various specific corrosives.

Field reports are also included describing performance of the alloys under varying corrosive conditions. Physical and mechanical properties are given as well as a full listing of various forms and shapes available.

Revised catalog (Form 108A) on Carpenter Stainless No. 20 and No. 20-Cb is issued by Alloy Tube Div., The Carpenter Steel Co., Dept. CP, Union, N. J. When inquiring specify CP 5984 on handy Reader Service slip opposite last page.

# HOT-OIL PUMPS Perform IN CARBON BISULFIDE PLANT

## Peerless Type PR PUMPS Perform WITH HIGHER EFFICIENCY, LOWER COSTS, IN MAJOR CHEMICAL PLANT...

**EFFICIENT**—A Peerless Type PR pump is an extremely rugged and dependable pump, designed especially to meet the complex requirements of liquid transfer in the process industries with complete efficiency. Its NPSH characteristics are excellent.

**MODERN DESIGN**—A Peerless Type PR pump is a modern pump, incorporating the most advanced design and construction features of center-line-mount-pumps yet providing every consideration for operational dependability and safety.

**ECONOMY**—A Peerless Type PR pump is not an expensive pump. Correctly applied it will meet every requirement for economical operation both in terms of "in service continuity" and its ease of maintenance when inspection or repair is indicated.

**TYPES**—A Peerless Type PR pump is available in packing gland or mechanical shaft seal (Type PRS) types. Top or end suction designs are available. Heavily constructed for high temperatures and pressures. Truly a modern pump designed especially for chemical process pumping. Find out about it today.

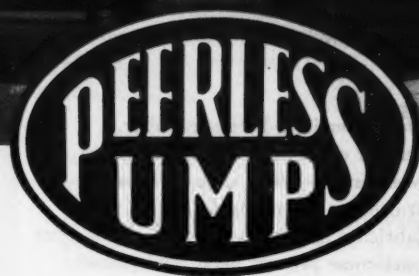
### PEERLESS PUMP DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION

Factories: Los Angeles, Calif. and Indianapolis, Indiana.

Offices: New York; Atlanta; Chicago; St. Louis; Indianapolis; Phoenix; Fresno; Los Angeles; Plainview and Lubbock, Texas; Albuquerque, New Mexico.

Distributors in Principal Cities; Consult your Telephone Directory.



### Type PR PUMP CHARACTERISTICS

|                          |  |
|--------------------------|--|
| CAPACITIES               | up to 1000 gpm   |
| OPERATING HEADS          | up to 625 feet   |
| CASE PRESSURES           | up to 400 psig   |
| DRIVES                   | horizontal electric motor is standard; other types as required |
| MATERIAL OF CONSTRUCTION | liquid end can be of any material suitable to intended service |

### MAIL COUPON NOW FOR BULLETIN

PEERLESS PUMP DIVISION  
FOOD MACHINERY AND CHEMICAL CORPORATION  
301 West Avenue 26, Los Angeles 31, California  
Please send us copy of Bulletin No. B-1605 describing Peerless Type PR and Type PRS Pumps.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 5985 opposite last page

## Quality Fabrication is our Business

Whether its a kettle, reboiler, reactor or other process equipment, Manning & Lewis engineers and craftsmen are ready to design and fabricate a unit, tailor-made to fit your particular process need, and priced to fit your budget.

You need only supply the performance requirements. An experienced M & L engineer will take it from there and specify type, size, method of construction, etc.—all the essentials that have made Manning & Lewis equipment preferred in plants from coast to coast.

Send your inquiry  
or have a  
M & L representative call.

**Manning & Lewis**  
Engineering Company

30 Ogden Street Newark 4, New Jersey



When inquiring check CP 5986 opposite last page

### NEW LITERATURE

#### Corrosive gases cleaned

Filter for cleaning hot, wet and corrosive gases is detailed in eight-page bulletin. Unit removes dust, dirt and impurities by passing gases horizontally through two or more cells containing moving granules.

Included in brochure are a variety of installation photos, engineering drawings of filter components and systems, and descriptive data.

Bul 4 is issued by Mechanical Industries, Inc., Dept. CP, 936 Grogan Bldg., Pittsburgh 22, Pa. Specify CP 5987 opposite last page.

#### Impervious-graphite pumps described

Six standard models of impervious-graphite centrifugal pumps ranging in size from 25 to 2000 gpm at 20 to 100' head are described in eight-page bulletin. Included are detailed parts drawings, accurate dimensional drawings, and performance charts for each model. Chemical and physical properties of impervious graphite are also listed.

Bul 854 is issued by Falls Industries, Inc., Dept. CP, 31909 Aurora Road, Solon, Ohio. Specify CP 5988 opposite last page.

#### Rotary action featured on poppet valve

A poppet valve with rotary action is described in four-page bulletin. Unit is designed for pressures to 125 psig air, temperatures to 175°F. Valve has bottom-ported base plate which permits removal of body without disturbing piping.

Bul 307 is issued by Ross Operating Valve Company, Dept. CP, 120 E. Golden Gate Ave., Detroit, 3, Michigan. Specify CP 5989 opposite last page.



new  
method of  
process  
heating and  
cooling

**\*saves 50%**

- \* in initial cost
- \* in heating and cooling time
- \* in tank space
- \* in maintenance labor

Each member of your buying committee should have this book which tells how Platecoils satisfactorily solve tank heating and cooling problems . . . and at the same time save time, money and manpower.

**PLATECOIL REPLACES PIPE COILS**

*Write for your free copy of Bulletin P54 today!*

**TRANTRER MANUFACTURING, inc., LANSING 4, MICHIGAN**

When inquiring check CP 5990 opposite last page

**NEW**



The **Barnstead**  
**PRESSURE BANTAM**  
**DEMINERALIZER**  
*delivers*  
**MINERAL-FREE WATER**  
*at point of use*

Delivers demineralized water in continuous flow under pressure at from 5 to 25 gallons per hour. Connects to any water line. Like turning on a faucet. Minerals are chemically removed from water by ion-exchange. No heat or cooling water employed. Uses high capacity replaceable cartridge. Hundreds of uses in industry. Bulletin #128 describes most of them.

**Barnstead**  
STILL & STERILIZER CO.

Write for  
Bulletin #128

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

When inquiring check CP 5991 opposite last page

CHEMICAL PROCESSING

### Names of over 450 users listed in dispersion mill catalog

Triple-action dispersion mills are pictured and described in 16-page catalog. Mills can grind, emulsify, disperse, and homogenize in a single pass. Four types of rotors are shown with information on their proper application. Cut-away drawing illustrates design and operating principle. Machines range in size from laboratory to full production models.

"Homogenizer-disperser" is issued by Tri-Homo Corporation, Dept. CP, 100 Highland Avenue, Salem, Mass. Specify CP 5992 opposite last page.

### Tests give steel the OK for pressure vessels

In a recent series of tests, suitability of company's high-strength Carilloy T<sub>1</sub> steel has been proved satisfactory for pressure vessel construction. Valuable data on pressure vessels, developed from test results, is included in 46-page bulletin.

"USS Presents T<sub>1</sub>" is available from United States Steel Corp., Dept. CP, 525 Wm. Penn. Pl., Pittsburgh 30, Pa. When inquiring specify CP 5993 on handy form opposite last page.

### Gives steps in making emulsion of petroleum resin

Proceeding from the formula and properties of petroleum resin Piccopale 100, two-page technical bulletin lists five steps in making a stable, fine particle size emulsion from resin and D-165 liquid.

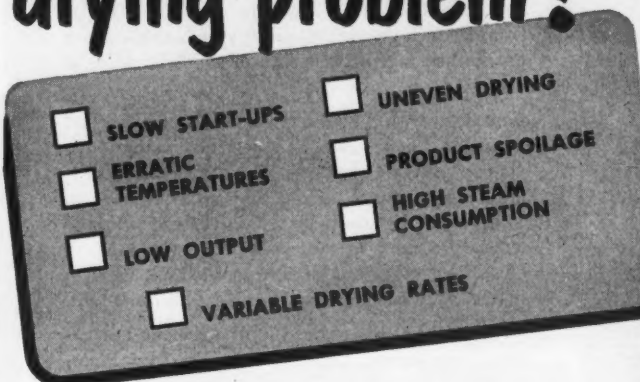
Bul P-12-188-0-2-54 is available from Pennsylvania Industrial Chemical Corp., Dept. CP, PO Box 240, Clairton, Pa. When inquiring specify CP 5994 on handy form opposite last page.

### Miniature mechanical chain and sprockets cataloged

Accurate motion transfer for miniature assemblies is provided by mechanical chain and sprocket described in eight-page catalog. Drawings and tables of chain and sprocket dimensions accompany engineering data and accessory information.

"Miniature Mechanical Chain and Sprockets" is available from Sierra Engineering Co., Dept. CP, 123 E. Montecito Ave., Sierra Madre, Calif. Specify CP 5995 on handy form opp. last page.

# Which is your drying problem?



*Often the solution  
is simple and inexpensive...*

While it's human to blame these dryer problems on the dryers themselves, the truth is that they're often due to...

...use of the wrong type of steam trap, causing equipment to waterlog... or heat-robbing air in steam spaces... or wasteful, unreliable, manual temperature control.

Any one of these could cause poor dryer performance... loss of production, product spoilage, waste of manpower and steam.

See (right) how simply and inexpensively these troubles have been cured by Sarco products and know-how. Tell us about your problems and we'll be happy to put our 43 years of experience to work for you. Just call your nearest Sarco representative, or write Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

# SARCO

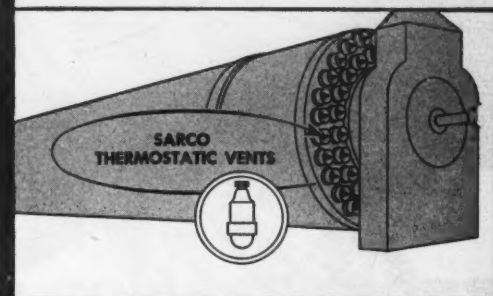
*improves product quality and output*

Sarco has a wealth of helpful information on trapping, air venting and temperature control. Tell us about your problem — we'll be glad to send you this information and case history solutions to problems similar to yours.



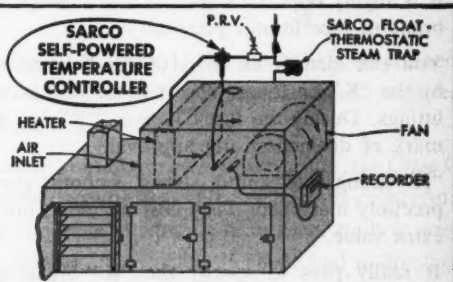
**SPOTTY DRYING ELIMINATED:** This atmospheric double drum dryer periodically waterlogged because of steam-lock in syphon pipe. Cold spots on drum surfaces, uneven drying and production slow-downs resulted.

By simply replacing the original traps with Sarco Float-Thermostatic Traps equipped with built-in steam-lock release valves... these drying troubles were completely eliminated.



**CURE FOR SLOW WARM-UP:** When air gets into steam spaces of a dryer it forms a heat-insulating film between the steam and heat-transfer surfaces... efficient transfer of heat from steam is impossible. Result: slow warm-up; prolonged drying time.

Simple, inexpensive cure for this condition are Sarco Air Vents, such as installed on above rotary steam tube dryer.



**TEMPERATURE PROBLEMS SOLVED:** Manipulating steam valves to control temperature wastes manpower and steam... is often the cause of product spoilage.

Sarco Self-Powered Temperature Controllers, as on this tray dryer, solve this problem... hold dryer at maximum temperature without danger of overheating. Inexpensive, simple and dependable.

When inquiring check CP 5996 opposite last page



## what's your **BRAND?**

You're mighty particular about the brands of many things you buy—drinks, food, shirts, shoes, suits, hats, etc.

It is highly important, too, to be particular about the brand of pipe fittings you buy.

You can identify an old, 100-proof brand of fittings by the "K" on them. We were the first to trademark fittings. During the last 67 years, "K" has become a mark of distinction and approval.

"K" fittings are sound, strong, smooth, symmetrical, precisely machined. They cost no more, but give you extra value.

It really pays to specify the "K" brand when you order fittings.



**THE KUHNS BROTHERS CO.**  
1808 McCall Street • Dayton, Ohio

Stocks in Dayton, Ohio; Los Angeles, Oakland, Calif. and Branford, Conn.

When inquiring check CP 5997 opposite last page

## NEW LITERATURE

### Catalog doubles as reference on dispersion processes

Written more like a textbook than a catalog, 48-page book covers fundamental principles of dispersion, and gives complete operational information on formulas for a number of coating materials. Portion of book also includes material from lectures given at University of North Dakota on the behavior of materials in solid, liquid, and dispersed phases.

Complete with photographs, charts, tables, and drawings, book shows and describes various dispersion mills in operation. Pictures illustrate how mills are constructed. Book contains inserts which, along with the cover stock, are coated with materials processed in the mills. Comparison charts of results of various dispersion methods used in industry and other technical data are also included.

"The Kady Mill" is issued by the Kinetic Dispersion Corporation, Dept. CP, 95 Botsford Place, Buffalo, N. Y. When inquiring specify CP 5998 on handy form opposite last page.

### Reports on outdoor paints containing acrylic resin

Results of a series of outdoor exposure tests, conducted to determine the formulation and application factors influencing performance of emulsion paints made with Rhoplex AC-33 are reported in 28-page bulletin. Typical formulations, test methods and details are given in detail. Paint manufacturing information and details on the material, an acrylic resin emulsion, are also presented.

"Progress Report No. 1 on Rhoplex AC-33" is issued by Resinous Products Div., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. When inquiring specify CP 5998A on handy form opposite last page.

### Physical and chemical properties, industrial uses of vermiculite

Absorption, catalytic, dielectric, filler, insulation, lubrication, resiliency, and thermal expansion characteristics of vermiculite are covered in 16-page technical data booklet. Over 40 practical applications of this basic material for the chemical processing industries are described, including use as a carrier for chelated metals. Physical and chemical properties are discussed. A selected bibliography of 19 references is included.

"Vermiculite Chemical and Physical Properties" is issued by Zonolite Co., Dept. CP, 135 S. LaSalle St., Chicago 3, Ill. When inquiring specify CP 5999 on handy form opposite last page.



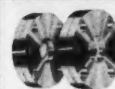
COMPLETE  
DATA  
SHEET  
FILE  
ON

### PRESSURE SYSTEM PROTECTION WITH FRANGIBLE DISCS

With more than  
25 years' exper-  
ience in applying  
known scientific

principles to pressure protection together with carefully supervised experimental work, our engineers have acquired a wealth of highly specialized knowledge in the field of metal behavior.

We offer this information to you as a continuing data sheet file. It's free! Write for it today!



**FRANGIBLE DISCS, INC.**

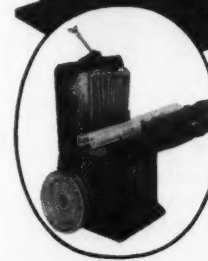
PENNS GROVE, N. J.

When inquiring check CP 6000 opposite last page

## PUMP

Liquids • Gases • Slurries

WITHOUT CORROSION  
OR CONTAMINATION



Wavelike Motion of  
Steel Fingers Forces  
Material Through Tubing

Prices range from .....\$55 to  
depending on size of pump and  
accessory equipment required. \$500

Write for Catalog

**SIGMAMOTOR Inc.**

18 North Main Street • Middleport, N. Y.

When inquiring check CP 6001 opposite last page

CHEMICAL PROCESSING

## TRANSPORTATION

(Continued from page 7)

the transportation factors involved in the selection of the site.

There are several other factors of utmost importance in selection of plant sites. To name but one, a study must be made of population shifts before a final conclusion is reached. We are well aware of the continuing trend of a population shift from the Atlantic Seaboard to the Far West. The markets of the Mountain Pacific Territory are of great importance today and will be of even greater importance in the future.

During the past twelve years, inflation has resulted in increased railroad freight rates on the average of 68%, and this trend will continue, although at a lesser rate. The percentage method of increasing freight rates has had a serious effect on the reasonable but high transcontinental rates, making it progressively more economical to construct chemical plants in the Mountain Pacific area rather than to ship from Eastern plant sites.

Industrial development of the South is also proceeding at a rapid rate, and much more rapidly than in the Middle Atlantic and New England states. Industrial development and population shifts along the Mississippi and Ohio Rivers and their tributaries are also of great importance and must be given full consideration.

In these brief examples may be seen the vital importance of detailed analysis of transportation factors with regard to location *before* a plant site is chosen.

### Automatically holds plastic being sealed

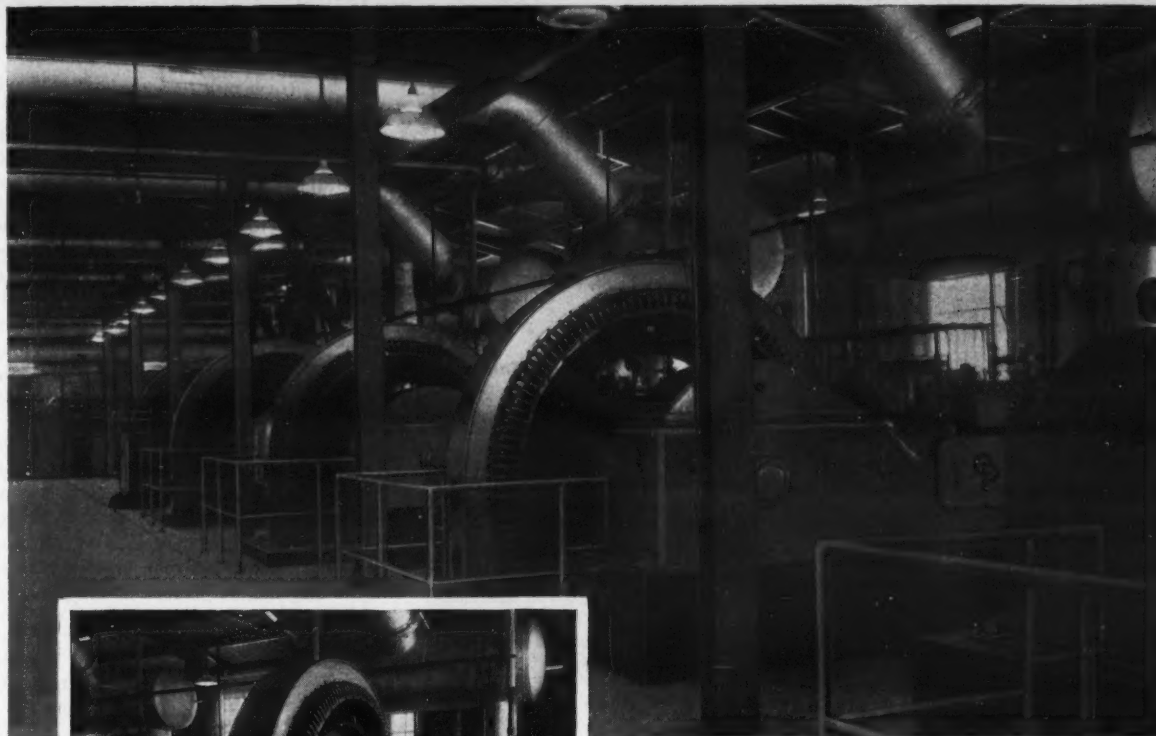
Heat sealer, which incorporates a magnetic-bar pressure device for holding plastic product being sealed, is described in leaflet.

Form HS954 is issued by Electronic Processes Corp., Dept. CP, 1047 San Antonio Road, Los Altos, Calif. Specify CP 6002 opposite last page.

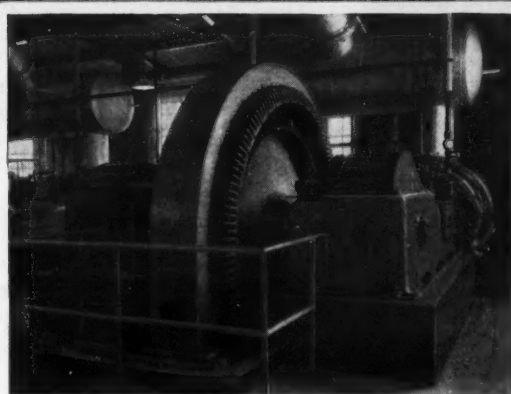
### Coumarone Indene resins in rubber compounding

Readily compatible with a wide variety of resins, polymerized bodies, and plasticizers, coumarone indene resins are utilized in modifying properties of many other resinous bodies and compounds based upon them.

Bul 12-64-4-1-54 is issued by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. Specify CP 6003 opp. last page.



Five 1,000 hp Class O-DE compressors installed in a chemical plant.



## CP COMPRESSORS

*in the process industry*

**ON TAP**

**24 HOURS A DAY!**

Chicago Pneumatic's heavy duty, Class O Compressors answer the 24 hour-a-day service demands usually required in process industries.

Engineered for continuous, heavy-duty usage, the Class O affords complete dependability with low operating cost. And they require minimum attention and upkeep. Built in sizes up to 2,000 hp, they're available in single and multi-stage designs, steam and electric drives, for a wide range of pressures. For more information write for Bulletin 726. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*



**Chicago Pneumatic**

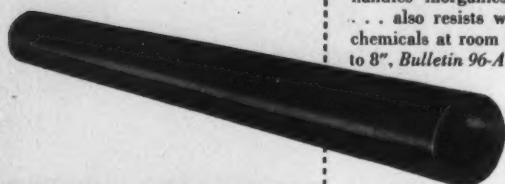
PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

When inquiring check CP 6005 opposite last page

#### FOR HOT CORROSIVES:

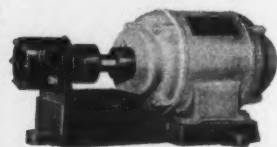
##### ACE TEMPRON

Heat-resistant nitrile hard rubber pipe handles inorganics at 250-275 deg. F. . . . also resists wide range of organic chemicals at room temperature. Sizes 1" to 8", Bulletin 96-A.



#### MIGHTY MIDGET

for pumping acids



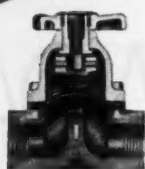
Jabsco neoprene-impeller pump made of Ace hard rubber outlasts, out-pumps anything in its pressure, size and price class. Capacity from 15 gpm. at 22 ft. head to 5 gpm. at 72 ft. head. Bulletin 97-A.

# ACE

chemical equipment

"more resistant to more corrosives"

From this "super-market" of corrosion-resistant equipment . . . backed by more than a century of engineering experience . . . you can select with confidence.



#### VALVES

for all-plastic piping systems

Trouble-free plastic diaphragm valves . . . choice of general-purpose rubber-plastic blend, Ace Parian (polyethylene) or Ace Saran. Handles most corrosive chemicals and food ingredients. Sizes 1/2" to 2", 50 psi. at 77° F. Bulletins 80 and 351.



#### 1001 USES for ACE-FLEX Tubing

Excellent chemical-resistant, all-purpose flexible plastic tubing. Sparkling clear, easy to clean, odorless, non-toxic, can be steam-sterilized. 1/8" to 1" ID. Bul. 66.

## ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY  
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 6006 opposite last page

#### VERSENE

(Continued from page 11)

in developing materials or supplying them, but simply in convincing people that they could do what they did.

Prior to 1948, a large part of their market was in local retailing. Chelating agents were sold for water softening. First attempts to make the chelation story known were made in small "longhair" classified ads — which in many cases told of an interesting chemical for which uses might develop. But these served their purpose and samples of the new materials were put in the hands of many potential users.

By describing chelating agents for water softening, inhibiting agents, rancidity preventives, antioxidants, and so forth, the company was able to more than double sales in one year. Still more important was the fact that new uses were beginning to show up — uses where there was no competition for Versene compounds because nothing else existed which could do what they did.

It's hard to find a "typical" problem or case history in the files of this organization. Work done in finding uses for chelating agents has involved all sorts of novel conditions and results. In one case orange trees are cured of a disease called *iron chlorosis* — a deficiency of iron. Such trees lose their healthy green appearance and stop bearing oranges. Seriousness of the problem can be gaged from the fact that sometimes a whole grove is affected — and trees take years to reach fruit-bearing age.

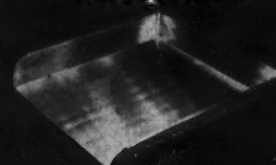
Growers with these non-bearing investments tried "feeding" the trees iron. Soil conditions, however, quickly put this iron into a nonusable form. But chelated iron is stable enough to be unaffected by soil chemistry, yet it can be broken down by the tree. Results of the treatment: two weeks after application trees green up again, four weeks later they may bloom. Within a year, trees are usually back to full production. Millions of pounds of chelated iron have been sold for this purpose in Florida.

No less dramatic is the role of chelating agents in heavy metal poisoning. Administered directly to the patient, they pick up heavy metal such as lead or radioactive isotopes, put the metal into soluble form. Normal processes of elimination can then rid the body of these death dealers. A Washington baby was saved from a surely fatal dose of lead in this way. Japanese fishermen caught in the fallout of H-bomb tests showed improvement after administration of Versene.

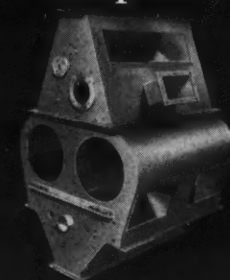
In the same way, compounds of Versene are used to clean up after spillage or contamination by radioactive materials. Used with soap and water, they probably constitute our best bet in decontamination.

Being in so many fields and having such varied final results to achieve, research receives a large allocation of the sales dollar. Besides uses mentioned here, these chemicals have been put to work on

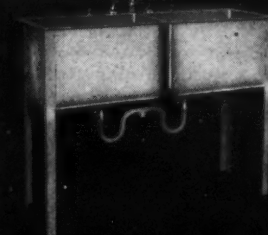
simple?



complex?



Littleford



fabricates it



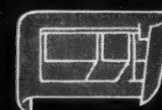
better . . . faster



and cheaper!

send us your blueprint  
for prompt estimate

FABRICATORS  
OF  
PLATE AND  
SHEET METAL  
PRODUCTS  
FOR INDUSTRY  
SINCE 1882



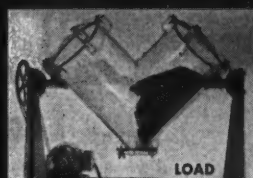
**LITTLEFORD**

LITTLEFORD BROS., INC.  
417 E. Pearl St. Cincinnati 2, Ohio

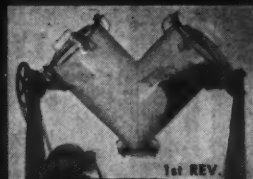
When inquiring check CP 6007  
opposite last page

CHEMICAL PROCESSING

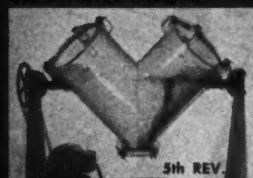
## Here's why the p-k twin shell blender is faster and better:



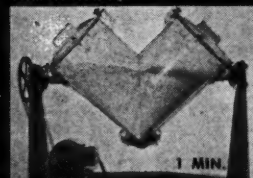
As this typical test illustrates, the effectiveness of this new blending principle assures a thorough blend in minutes.



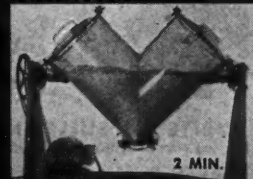
The gentle rolling, folding, dividing and combining action with a simultaneous cross flow can be seen in the first revolution.



End-to-end dispersion and intimate mixing becomes evident. This is true regardless of particle size, form or density.



The mass rotates close to the axis and does not require rapid rotation. Neither separation nor attrition takes place.



Thorough blending has been achieved. Actual blending time, of course, varies with the material.

New Catalog No. 13 gives complete data on sizes, construction details and performance.

**the  
Patterson-Kelley Co., Inc.**  
730 Lackawanna Ave.  
East Stroudsburg, Pa.  
© 1904

When inquiring check CP 6008  
opposite last page

such diverse jobs as preventing food spoilage (by taking metal ions out of action), dissolving kidney stones, desulfurizing sour crude oil, tenderizing peas, tanning leather, preventing coagulation of blood. And the list continues to grow. There is even a possibility that Versene compounds may partially take the role of a fountain of youth — studies indicate that they can clear blood vessels of "sludge" associated with the normal aging process.

One thing has never been in short supply at Framingham — hard work. With Frank Kottek at the helm, the small staff has built chelation to better than a million dollar a year business. A company plane has carried Dr. Jack Singer, Technical Sales Manager (also well-known as "the flying Ph.D.") to bring technical thinking to bear on new uses all over the country. More than a dozen research chemists back at Framingham are working on a multitude of problems of this type, too.

On December 1 of last year, The Dow Chemical Company bought Versenes, Incorporated. But the regular staff at Framingham continues to push back chemical frontiers.

Actually this combination of Dow & Versene is a natural outgrowth of close cooperation in the past. Dow had been given full information on manufacture so that a volume source of chelating agents could come into operation if they were suddenly needed for large scale radioactivity decontamination.

To say that we have not yet heard the last of Versene is to miss the point — we have not yet heard more than the beginning.

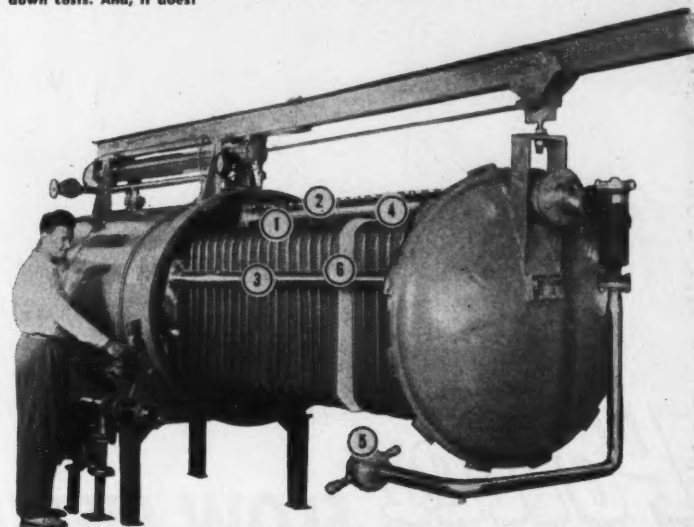
### Presents latest revision of manual on dyeing synthetic fibers

Fourth edition of digest-size compendium on dyeing synthetic fibers includes developments, methods, and ideas on the subject that were not included in third edition. It continues to outline methods of dyeing briefly and to give an indication of the fastness properties that may be expected on various synthetic fibers, alone and in blends. Eleven materials are covered (including acetate, Dacron, Dynel, Fortisan, nylon, Saran, Vicara and acrylic fiber and Celcos), along with 15 blends of these materials. For each material, some data on chemical composition and suggested methods and materials for dyeing are given, along with indications of fastness properties to be expected. All trade names are identified by manufacturing company. Digest-size bulletin is 56 pages.

"Dyeing Synthetic Fibers" is issued by General Dyestuff Co., a Sales Div. of General Aniline & Film Corp., Dept. CP, 435 Hudson St., New York 14, N. Y. When inquiring specify CP 6009 on handy form opposite last page.

## Clear FACTS on modern filtration

Unimportant features in filtration equipment usually require considerable mental juggling to determine any value at all. However, no mental gymnastics are required when you look at the unique features built into Process Filters' Model H, designed for semi-dry solids and filtrate recovery. The Model H has been engineered to set a new standard of performance for filtration equipment in almost every process that must sustain quality while holding down costs. And, it does!



**1. The only process filter with AUTOMATIC LEAF SHUT-OFF** (pat. applied for) for fabric covered leaves. This simple, low cost feature automatically shuts off any leaf from the filtrate manifold whenever cloth damage or failure occurs which would otherwise pass solids into the filtrate, and permits continuous operation without costly shut-downs. No operator can supplant this feature operating a filter with individual leaf sight glasses and shut-off valves found in other equipment.

Here is a typical comment from a user of this feature: "Installation of the Automatic Leaf Shut-Off assemblies has eliminated any filter-aid passage from bag failure". Here are other important features on the Model H Filter:

### 2. TOP LEAF SUSPENSION

Unlike filters with bottom discharge manifolds that require digging or sluicing of the cake to dislodge dropped cake, Process Filters' Model H has a top manifold from which the leaves are suspended providing a clear drop for the cake discharge . . . another labor saving, time saving feature.

### 3. DISTRIBUTION MANIFOLD

Distribution manifold located on both sides of the leaves, equalizes fluid distribution, reduces settling of solids, produces a more uniform cake and improves recovery when either air blowing, steaming or washing.

### 4. BOTTOM DRAINAGE LEAVES

are optionally used on top discharge manifolds as illustrated. This feature eliminates loss of filtrate in the leaf with blow-down.

### 5. RAPID COUPLER

doubles as a quick filtrate pipe connector and as an air flange to reverse-blow fabric covered leaves to discharge cake.

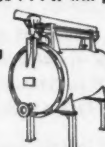
### 6. TEFLON CLOTH PROTECTORS

protect fabric covered leaves from abrasion by spacers.

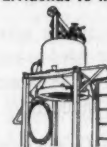
These are only a few of the features you'll find in the complete line of Process Filters . . . some particularly suited to your process . . . ALL designed to give you a better product at lower cost to keep you ahead of competition. You'll be interested in what Process Filters' engineers have for you . . . It will pay you big dividends to find out.



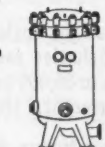
Sluicing



Dry Solids Recovery



Batch Type



Cartridge Polishing

Process Filters, Inc. engineers and builds many types of filtration equipment to meet your particular requirements. For further information, mail this coupon.



**PROCESS  
FILTERS, Inc.**  
1807 Elmwood Avenue,  
Buffalo 7, N. Y.

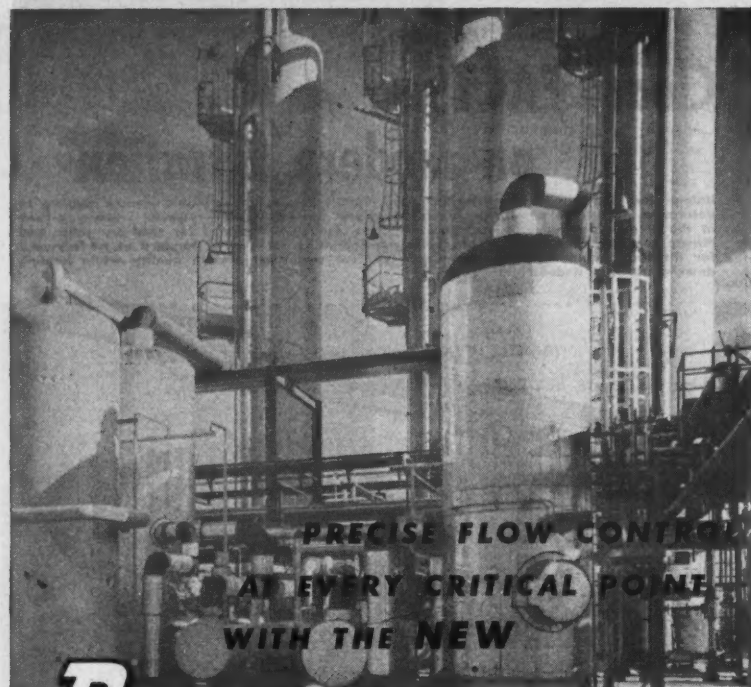
A subsidiary of Bowser, Inc. **BOWSER**

Gentlemen:  
Please send me information on the following:

- ☐ Dry Solids Recovery Filters
- ☐ Batch Type Filters
- ☐ Sluicing Filters
- ☐ Cartridge Polishing Filters

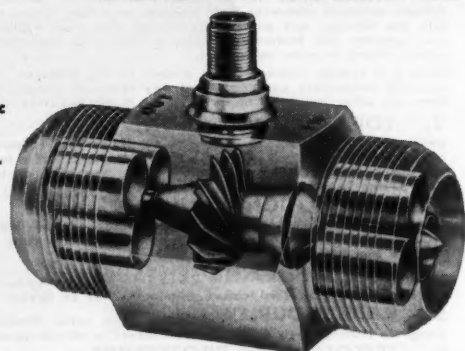
Name .....  
Title .....  
Company .....  
Address .....  
City ..... Zone ..... State .....

When inquiring check CP 6010 opposite last page



# Potter FLOW METER

Patented Potter Electronic Sensing Element utilizes frictionless "floating rotor"... is inherently linear for sustained accuracy over a wide range of flow rates.



● The Potter Electronic Flow Meter is an entirely new concept of flow meter design, already the standard of precision in aeronautical research, where even fractional errors can be disastrous.

Installed at any angle, it measures small or large quantities of acids, caustics, suspensions, slurries and other hard-to-handle liquids at temperatures to 1200°F and pressures to 35,000 psi with  $\pm 1/2\%$  accuracy! Flow is measured in weight or volume units via electrical impulses induced by the turbine-type sensing element.

Potter Flow Meters are simple and economical to install, trouble-free in operation, low in maintenance. Complete Potter systems are available with Indicators, Recorders and Totalizers (for automatic sequencing of batch operations) or Telemeters.

Write for Bulletin S-1.

**Potter**

**POTTER AERONAUTICAL COMPANY**  
Route 22 • Union, New Jersey • Phone MUrdock 6-3010  
makers of Potter engineered products

When inquiring check CP 6011 opposite last page



Write to these addresses for more information on conventions and exhibits listed on page 5 of this issue.

Air Pollution Control Association, 4400 Fifth Avenue, Pittsburgh 13, Pa. Mr. H. C. Ballman, Executive Secretary.

American Chemical Society News Service, 60 E. 42nd Street, New York 17, N. Y.

American Institute of Chemical Engineers, 25 W. 45th St., New York, N. Y.

American Institute of Electrical Engineers, 33 West 39th Street, New York 18, N. Y.

American Management Association, 330 W. 42nd Street, New York 36, N. Y., Mr. Donald G. Keen, Press Relations Manager.

American Oil Chemists' Society, 2100 Robert E. Lee Blvd., New Orleans 19, La., Mr. Carroll L. Hoffpauir, Publicity Chairman (for 42nd Annual Meeting only.)

American Power Conference, Illinois Institute of Technology, 35 W. 33rd St., Chicago 16, Illinois, Mr. Ralph Mitchell.

American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

Basic Materials Exposition, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Chemical Market Research Association, c/o Jefferson Chemical Co., 260 Madison Ave., New York 16, N. Y., Robert Henderson.

Conference on Biological Waste Treatment, Manhattan College, 242nd St. & Broadway, New York 71, N. Y. Mr. W. W. Eckenfelder, Assistant Professor.

National Association of Corrosion Engineers, 1061 M & M Building, Houston 2, Texas, Mr. L. W. Ewing, Jr., Chairman, 1955 Conference Committee.

National Materials Handling Exposition, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Society of the Plastics Industry, 295 Madison Ave., New York 17, N. Y.

## NEW MONTHLY FEATURE

This column of association and society addresses will appear every month — to be used with the meeting schedule in front of the issue (page 5). Use address list when writing for more details about reservations, programs, reprints.

## basic PUMP SELECTION GUIDE

Learn BASIC FACTS before deciding on TYPE of PUMP

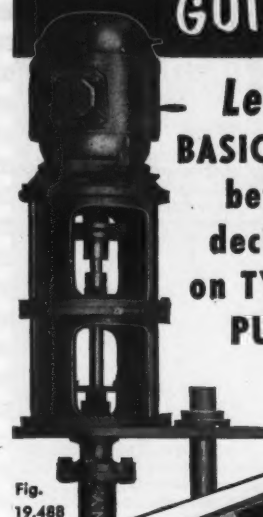


Fig. 19,488

Nickel, Nickel Alloys and all other Castable-Machineable Metals and Alloys are used to build Taber Pumps.

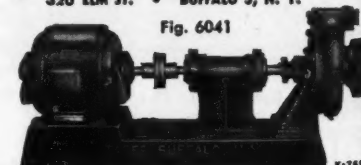


Big illustrations and brief descriptions with capacities and adaptability of types of pumps are contained in this unbiased compilation of facts to help avoid costly misapplication.

WRITE for BULLETIN S-146 on your company stationery, please.

**TABER PUMP CO. (Est. 1859)**  
320 ELM ST. • BUFFALO 3, N. Y.

Fig. 6041



**TABER**

When inquiring check CP 6012 opposite last page

CHEMICAL PROCESSING

PRO and



Acetylene pressure  
Acetylsalicylic  
Additives, F  
Adipic Acid  
Agitators  
Side-drive  
Airlocks, R  
Air Pollution  
Air Traps  
Air Vents  
Alarm System  
Alloys, Met  
Analyzers, C  
Oxygen  
Anhydrides,  
Aromatic Cl  
Aromatics,  
Asphaltic P  
Atom Mod

Baffles for  
Bags, Multi  
Balances, L  
Batch Meas  
Bearings, O  
Bellows, Te  
Bin Flow A  
Bins, Pulsat  
Blenders  
Automatic  
Twin-shel  
Blowers, P  
Boiler Baffl  
Boilers, Pac  
Self-conta  
Boric Acid  
Box Car Un  
Boxes  
Corrugate  
Brakes, Mag  
Brighteners  
Burners

Calciners  
Can Seals  
Carbohydrat  
Carbonate o  
Carbon Blac  
Carbon Dio  
Carbon Dio  
Caustic Pot  
Caustic Sod  
Cements, H  
Insulating  
Centrifugals  
Ceramics, L  
Chain and S  
Chains  
Roller  
Channel &  
Chelating A

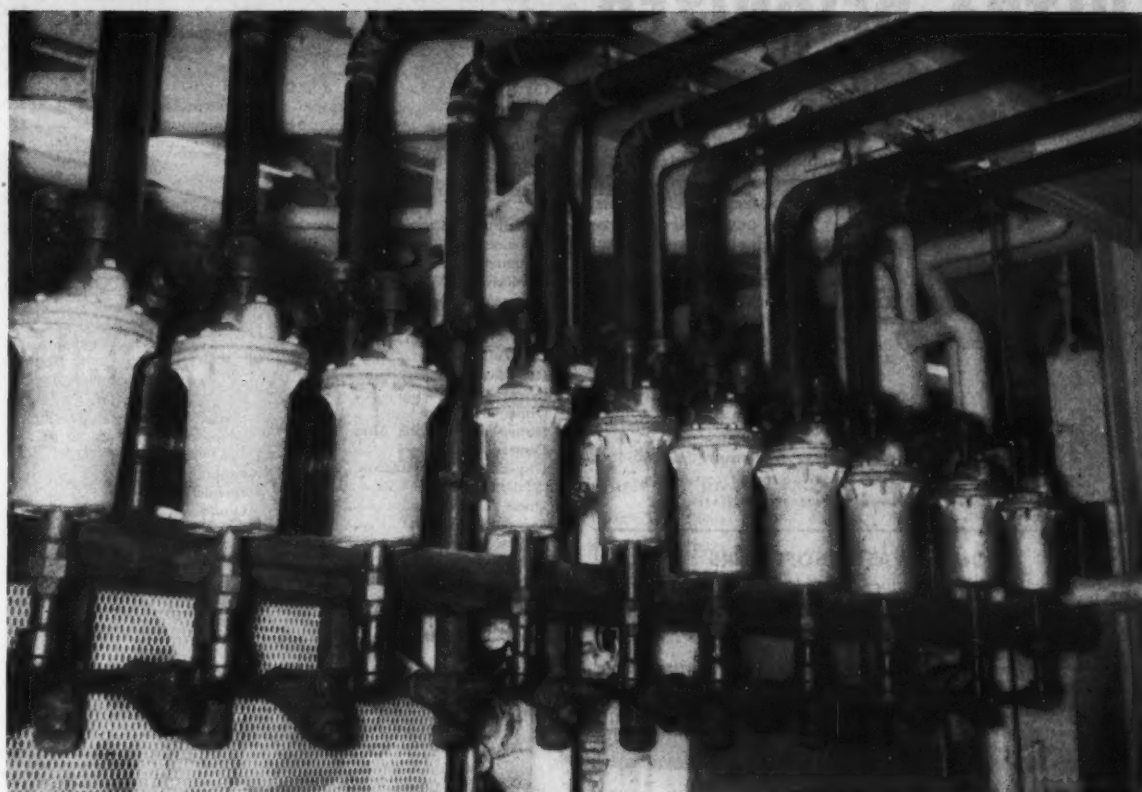
MARCHE

# PROCESSES, EQUIPMENT and MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to last page and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.



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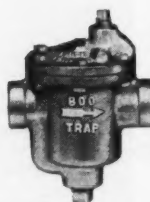


## Tip on Choosing Steam Traps: Run Tests with a Pyrometer



Bottom inlet-top outlet traps in six sizes, 1/2" to 2" connections; 950 to 20,000 lbs/hr capacity.

Side inlet-side outlet traps in five sizes, 1/2" to 1 1/4" connections; 680 to 6700 lbs/hr capacity.



Integral strainer traps in three sizes, 1/2" and 3/4". Cost less than trap and separate strainer, save fittings and labor.

**A common problem**—Traps on Rogers spray driers at Rochester Dairy Company, Rochester, Minn., required frequent servicing—used up about two months of one man's time annually. And, then, within about 30 days after trap servicing, drier temperatures would be 100 degrees below steam temperature. Nobody has to put up with such trap troubles!

**Take a tip from this solution!**—Henry T. Maass, Building and Utility Supt., took action. He ran extensive pyrometer tests on his driers, using different makes of traps.

**100° hotter!**—The driers are now equipped with Armstrong inverted bucket steam traps. Temperatures correspond to steam pressure—100 degrees hotter than before. Maintenance?—negligible. Rochester carries \$63.31 of Armstrong trap parts in maintenance store against

\$873.52 in parts for another make of traps that haven't been replaced yet.

**Moral**—A small investment in Armstrong steam traps can make a world of difference in performance of production equipment and in cost of maintenance. Call your local Armstrong Representative, he has the products and the experience and the ability to be of real assistance.

### FREE CATALOG

The 44-page Steam Trap Book is "the handbook of steam-trapping". Selection, installation, maintenance, capacities, data, prices, tables, charts, useful material—yours for the asking without any obligation. Also see data in Sweets or Chemical Engineering Catalog.



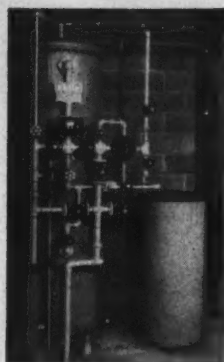
Armstrong Machine Works  
880 Maple Street, Three Rivers, Michigan

# ARMSTRONG STEAM TRAPS

When inquiring check CP 6013 opposite last page

# ULTRA-DEIONIZER

## Produces Highest Quality Mineral-Free Water



This remarkable single tank, mixed-bed ion exchange unit produces deionized water for less than 25 cents per 1000 gallons (based on 10 grain water).

### FEATURES

- Replaces Distillation or Evaporation
  - at 1% to 10% of the cost
- Removes All Ionizable Impurities
  - including CO<sub>2</sub> and silica
- Up to 44% Greater Capacity
  - double-check design
- Requires Minimum Space
  - lower investment cost

Write for Bulletin 512

### ZEOLITE WATER SOFTENERS

New Bulletin 611 describes "Double-Check" type water softener that delivers up to 44% more soft water. Also covers complete line of equipment and treatment for any water conditioning need. Write for your copy.

### ELGIN-REFINITE

DIVISION OF ELGIN SOFTENER CORPORATION  
180 NORTH GROVE AVENUE, ELGIN, ILLINOIS

OTHER PRODUCTS: Softeners • Dealkalizers • Lime Soda Softeners • Water for Bulletin • Deaerating Heaters • Filters • Treatment

When inquiring check CP 6014 opposite last page

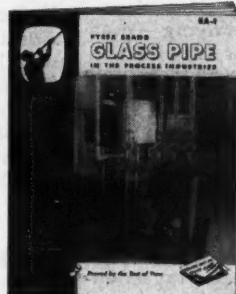
## How many of these pipeline headaches do YOU have?

- ☐ Corrosion
- ☐ Clogging
- ☐ Cleaning
- ☐ Cost
- ☐ Contamination

This Corning bulletin can help you

"PYREX brand 'Double-Tough' glass pipe in the Process Industries" tells how others in a variety of process industries are whipping tough piping problems with glass pipe. You'll recognize the names of most of the companies who are using PYREX pipe to handle such acids as sulphuric, hydrochloric, nitric, acetic, and such other fluids as chlorinated hydrocarbons, hydrogen peroxide, bromine, brines, low-concentration alkaline solutions, wine, milk, other beverages and foods.

The book covers a wide range of products, problems and processes. Among them you may well find problems similar to yours—solved with PYREX pipe. Bulletin EA-1 is free. Simply send the coupon or check this publication's reader service card for your copy.



Corning means research in Glass

### CORNING GLASS WORKS

33 CRYSTAL STREET, CORNING, N. Y.

Please send me Bulletin EA-1: "PYREX brand 'Double-Tough' glass pipe in the Process Industries."

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

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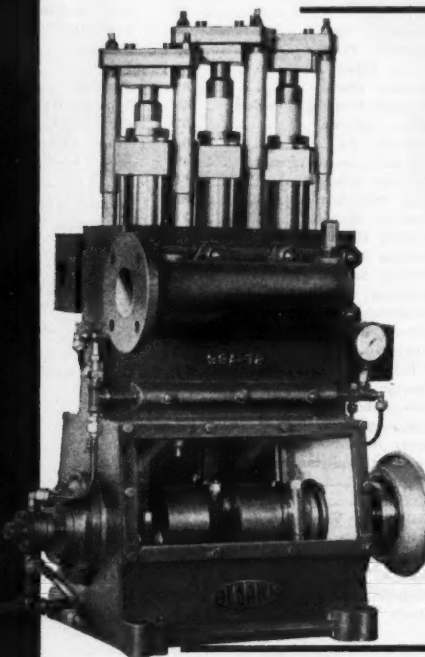
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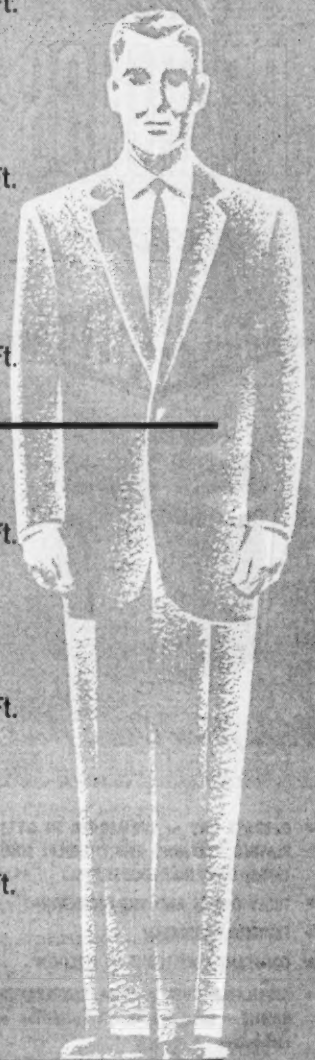
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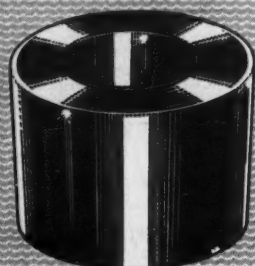
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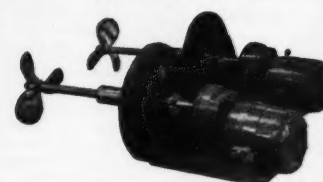
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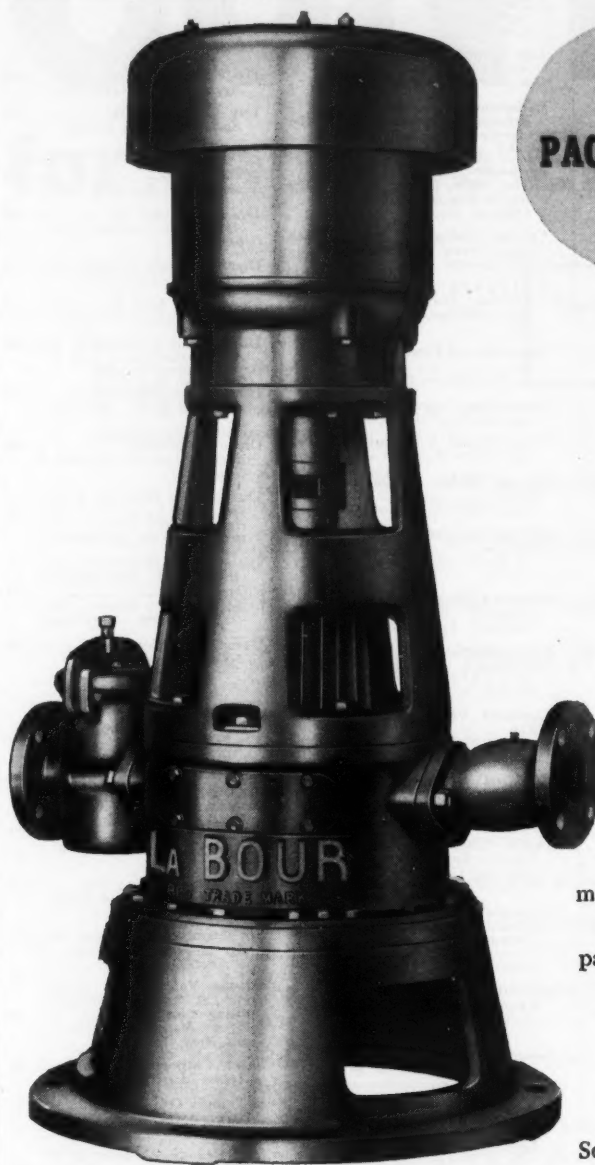
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CHEMICAL PROCESSING

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## for Flooded Suction or Suction Lift



It's  
**PACKINGLESS**

It's  
**SELF PRIMING**

It's  
**CENTRIFUGAL**

It's  
**LaBOUR**

The new Type CG LaBour is an improved model, operating under positive or negative suction lift conditions as required. It has no packing or close fitting parts in contact with the liquid.

The open end of the dynamic seal need not be exposed to atmosphere, so escape of volatile or toxic gases may be prevented. The seal can be flushed during normal operation if desired.

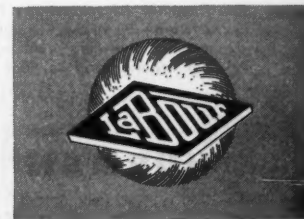
Send for your copy of Bulletin G-1, which gives complete details.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

# LaBOUR

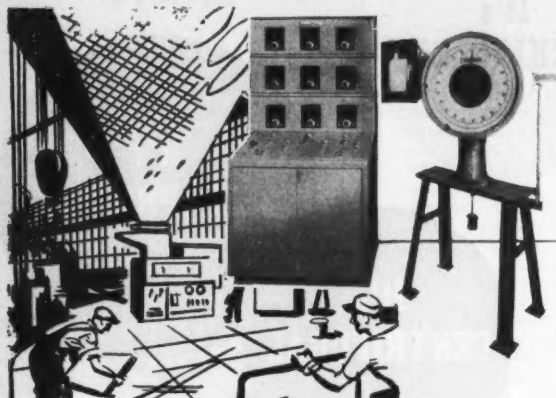
THE LaBOUR COMPANY, INC. \* Elkhart, Indiana, U.S.A.

When inquiring check CP 6022 opposite last page



# NEW Automatic Batching System

For Rapid, Accurate Weighing with **THURMA-Tronic SCALES**



## APPLICATION

The Thurma-Tronic batching system is adaptable for use in any batching operation of the process industries. This new electronic batching system is not only available for new plants but it is also adaptable to most existing plants. If you wish to increase production and reduce batching costs, it will pay to investigate the money-saving advantages of the automatic and accurate Thurma-Tronic batching system.

## SPECIAL FEATURES

**FOR ALL BATCHING PLANTS . . . OLD or NEW**—The Thurma-Tronic batching system may be used on any existing plant as well as on original installations.

**UNLIMITED INGREDIENTS and FORMULAS**—Because of the electronic design, any number of materials may be controlled. In addition, any number of preset formulas may be weighed by the Thurma-Tronic batching system. Changes in formulas are quickly made by resetting the dials.

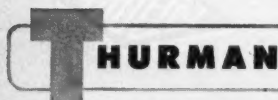
**RAPID WEIGHING**—The Thurma-Tronic batching cycle is accomplished in a matter of seconds. This system may be set by the operator for one batch, continuous batching or any specific number of batches.

**VERSATILE**—The Thurma-Tronic batching system is adaptable to either accumulative or simultaneous weighing batch plants.

**SERVICE**—Because this is an electronic unit, based on the same principle as radio, any competent radio repairman can check tubes and make repairs in the event servicing becomes necessary.

**ACCESSORIES**—Strip chart recorders, one turn dials and other modifications are available for specific requirements of any batching operation.

Complete information on Thurma-Tronic batching systems is available by writing for Bulletin 701. If, however, you have a specific batching problem, give us general information and our engineers will be glad to work out the details with you.



Precision Products Since 1918  
**MACHINE COMPANY**

154 NORTH FIFTH STREET, COLUMBUS, OHIO

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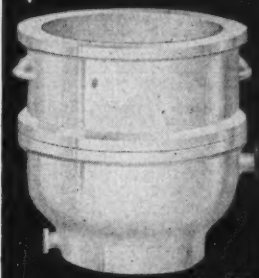
# CHEMICAL CERAMIC Filters

## VACUUM FILTERS

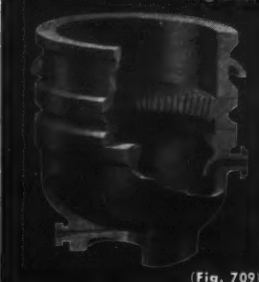
"U. S." chemical ceramic vacuum filters are made in three ceramic bodies: white chemical porcelain; standard "Denstone" chemical stoneware; and "Ceratherm-550" heat-shock-resistant chemical stoneware. All three bodies will withstand a complete vacuum.

Available in a range of types, including two-piece units with removable support plates, two-piece units with integral support plates, and three-piece sectional units. Sizes range from small laboratory filters up to units of 100 gallon capacity.

Write for Bulletin F-40



(Fig. 270A)



(Fig. 709)

## U. S. STONWARE

Akron 9, Ohio

When inquiring check CP 6024 opposite last page

# J. E. SIRRINE CO.

GREENVILLE • SOUTH CAROLINA

*Engineers*  
ESTABLISHED 1902



PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL • METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL • WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

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Fritzsche Bros.  
Fuller Company  
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Agency-Holmes  
Gaylord Company  
Agency-Oak Associates  
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Agency-Drying Machine  
Agency-Weiss  
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MARCH, 1955

# CONTEST

## for Capable Engineers only

Guess the name of this manufacturer of vacuum equipment

## PRIZES:

1. GRAND PRIZE — Trip around the universe.
2. SECOND PRIZE — Option on the Brooklyn Bridge.
3. THIRD PRIZE — Six pairs of three-legged overalls.
4. ONE THOUSAND RUNNER-UP PRIZES — one thousand ouija boards.

## CLUES:

1. Company founded in 1917
2. Both original founders still active in the business.
3. Each founder has a son thoroughly trained in engineering who is also active in the business.
4. The company has specialized in jet vacuum equipment more than any one firm.
5. Has made hundreds of jet cooling units in capacities up to 3000 tons of refrigeration.
6. Makes an extensive line of other jet equipment including jet mixers, jet heaters, jet absorbers, jet pumps, and jet fume scrubbers.
7. Has designed and built thousands of barometric condensers in standard and a great variety of special materials.

## Why, of course it's

CHILLWATER VACUUM EQUIPMENT • EVAPORATOR STEAM JETS • CONDENSING EQUIPMENT  
New York Office — 17 John Street, New York 38, N. Y. Phone CORland 7-5531  
Main Office — 751 Central Ave., Westfield, New Jersey Phone WESTfield 2-4200

CROLL-REYNOLDS CO., INC.

When inquiring check CP 6026 opposite last page







\*TEFLON

SHEET, ROD, TUBE, SPRAY COATING,  
PRECISION MOLDED AND MACHINED PARTS

made by

FLEXROCK COMPANY  
PHILADELPHIA 1, PA.  
BAring 2-5500

\*DuPont's trademark for  
tetrafluorethylene resin

When inquiring check CP 6031  
opposite last page

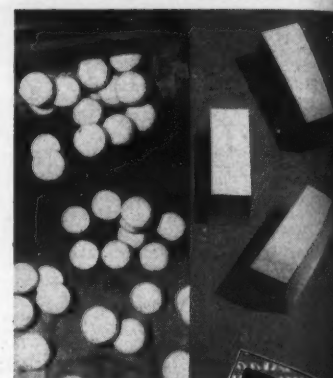
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MARCH, 1958

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| 5779  | Safety Work Clothes                 | 5832  | Fluorocarbon Filters              | 5901  | Welding Machine                                  | 5940b | Filter Media                                     | 5999  | Vermiculite                                |
| 5780  | Safety Equipment                    | 5833  | Dust Collector                    | 5902  | Water Filter                                     | 5940c | Diaphragm Pumps                                  | 6000  | Frangible Discs                            |
| 5781  | Electric Motors                     | 5834  | Vacuum Forming Presses            | 5903  | Rotary Pressure Joint                            | 5941  | Metal Cladding Corrosion Control                 | 6001  | Liquid Pumps                               |
| 5782  | Thermocouples                       | 5835  | Wire-cloth Components             | 5904  | Centrifugal Pumps                                | 5942  | Mildew Test Kit                                  | 6002  | Heat Sealer                                |
| 5783  | Electric Arc-resistance Plugs       | 5836  | Self-Contained Boiler             | 5905  | Magnetic Disc Brake                              | 5943  | Impact Mill                                      | 6003  | Coumarone Indene Resins                    |
| 5784  | Protective Clothing                 | 5837  | Line-type Purifier                | 5906  | Compact Solenoid Valves                          | 5944  | Corrosion-resistant Steel Plate, Pipe & Fittings | 6005  | Compressor                                 |
| 5785a | Steel Gratings                      | 5838  | Centrifugal Separators            | 5907  | Concrete Silos                                   | 5945  | Surface Roughness Measure                        | 6006a | Hard Rubber Pipe                           |
| 5785b | Steel Stair Treads                  | 5839  | Pilot Plant                       | 5908  | Direct-fired Air Heater                          | 5946  | Heat Transfer Cement                             | 6006b | Hard Rubber Acid Pump                      |
| 5786  | High-pressure Pumps                 | 5840  | Alloy Fabricators                 | 5909  | Deodorizer                                       | 5947  | Pressure Vessels                                 | 6006c | Plastic Tubing                             |
| 5787a | Gas Analyzers                       | 5841  | Propellers                        | 5910  | Concrete Sealer                                  | 5947b | Metal Fabrication                                | 6006d | Plastic Diaphragm Valves                   |
| 5787b | Gas Alarm System                    | 5842  | Filters                           | 5911a | Corrosion-resistant Pump                         | 5948  | Drying Equipment                                 | 6007  | Metal Fabrication                          |
| 5787c | Oxygen Analyzers                    | 5843  | Size-reduction Equipment          | 5911b | Corrosion-resistant Pump, Valves, Pipe, Fittings | 5949  | Applied Statistics                               | 6008  | Twin-shell Blender                         |
| 5788  | Non-hazardous Recorder-controller   | 5844a | Calciners                         | 5912  | Valves   | 5950  | Safety Guide                                     | 6009  | Dyeing Synthetic Fibers                    |
| 5789  | Fire-resistant Chemical             | 5844b | Coolers                           | 5913  | Hot and Cold Spraying Equipment                  | 5951  | Neoprene Filter Paper                            | 6010a | Batch-type Filters                         |
| 5790  | Dust Filter                         | 5844c | Dryers                            | 5914  | Stainless Tubing                                 | 5952  | Continuous String Filters                        | 6010b | Cartridge Polishing Filters                |
| 5791  | Ovens                               | 5845  | Compressors                       | 5915  | Insulating Cement                                | 5953  | Soap Manufacture                                 | 6010c | Dry Solids Recovery Filters                |
| 5792  | Electronic Equipment                | 5846  | High-temperature Lubricants       | 5916  | Wire Markers                                     | 5954  | Ion Exchanger                                    | 6010d | Sluicing Filters                           |
| 5793  | Gas Determinations                  | 5847  | Cellular Glass Insulation         | 5917  | Tank Heaters                                     | 5955  | Industrial Solvents                              | 6011  | Flow Meter                                 |
| 5794  | Germanium Reagent                   | 5848  | Dust Collection & Recovery        | 5918  | Flexible Strut Joints                            | 5956  | Synthetic Rubber                                 | 6012  | Pumps                                      |
| 5795  | Karl Fischer Reagent                | 5849  | Flash Drying                      | 5919  | Needle Valve                                     | 5957  | Leak-proof Pump                                  | 6013  | Steam Trap                                 |
| 5796  | Filter Paper                        | 5850  | Liquid Flow Measurement & Control | 5920  | Woven Fiber Glass Sleeving                       | 5958  | Filters  | 6014a | Ion Exchangers                             |
| 5797  | Gas Analyzers                       | 5851  | Moisture Trap                     | 5921a | Filters  | 5959  | Plug Valves                                      | 6014b | Water Softeners                            |
| 5798  | Processing Equipment                | 5852  | Plastic Tubing                    | 5921b | Evaporators                                      | 5960  | Submersible Turbine Pumps                        | 6014c | Dealkalizer                                |
| 5799  | Analogue-Digital Converter          | 5853  | Solvent Extraction Column         | 5922a | Crystallizers                                    | 5961  | Safety Trucks                                    | 6014d | Lime Soda Softener                         |
| 5800  | Stress Indicator                    | 5854  | Brake Motor                       | 5922b | Processing Towers                                | 5962  | Sea-water Condensers                             | 6014e | Deaerating Heater                          |
| 5801  | Stirring Rod Gland                  | 5855  | Controlled-capacity Pumps         | 5922c | Pressure Vessels                                 | 5963  | Mastic Coating                                   | 6014f | Water Treatment                            |
| 5802  | Mineral Filter                      | 5856  | Flow Meters                       | 5922d | Flat-bottom Tanks                                | 5964  | National Fire Code                               | 6015  | Glass Pipe                                 |
| 5803a | Rotary Vacuum Pump, Type SS         | 5857  | Porcelain Tower Packings          | 5923  | Pipe Fittings                                    | 5965  | Industrial Wipers                                | 6016  | "Serving Old Roots"                        |
| 5803b | Rotary Vacuum Pump, Type RE         | 5858  | Packaged Dewtherm Vaporizers      | 5924  | Non-clogging Solids Pump                         | 5966  | Flexible Hose                                    | 6017  | Centrifugal & Turbine-type Pumps           |
| 5804  | Durometer                           | 5859  | Switches                          | 5925  | Glass-fiber Insulation                           | 5967  | Industrial Safety                                | 6018  | Direct-flow Triplex Pump                   |
| 5805  | Laboratory Balances                 | 5900  | Valve Controls                    | 5926  | Steam Jet Ejectors                               | 5968  | Citric Acid in Fats                              | 6019  | Submerged Oilless Bearings                 |
| 5806  | Viscometer                          | 5901  | Dust Control System               | 5927  | Centralized Lubrication System                   | 5969  | Porous Stainless Filters                         | 6020  | Spray Booths                               |
| 5807  | Gas Analyzers                       | 5902a | General-purpose Pumps             | 5928  | Tubing Steels                                    | 5970  | Industrial Fans (State Which)                    | 6021  | Mixers                                     |
| 5808  | Atom Models                         | 5902b | Heavy-duty Pumps                  | 5929  | Differential Pressure Transmitters               | 5971  | Pistol Grip Tube Cleaners                        | 6022  | Self-priming Centrifugal Pumps             |
| 5809  | Rotating Vacuum-type Evaporator     | 5902c | Underwriter Pumps                 | 5930  | Hose Clamp                                       | 5972  | Package Sealers                                  | 6023  | Batching System                            |
| 5810  | Mechanical Shaft Seal               | 5902d | Sanitary Pumps                    | 5931  | Immersion Heater                                 | 5973  | High-pressure Solenoid Valves                    | 6024  | Ceramic Vacuum Filters                     |
| 5811a | Granulator                          | 5902e | Oil-industry Pumps                | 5932  | Cellular Glass Insulation                        | 5974  | Packaging Ideas                                  | 6025  | Plant Engineers                            |
| 5811b | Mixer                               | 5902f | LP-gas Pumps                      | 5933  | Quick-seal Couplings                             | 5975  | AC Motors  | 6026a | Jet Vacuum Equipment                       |
| 5811c | Oven                                | 5902g | Hydraulic Pumps                   | 5934  | Tank Lining                                      | 5976  | Plate Heat Exchanger                             | 6026b | Jet Cooling Units                          |
| 5811d | Rotary Press                        | 5902h | Special-application Pumps         | 5935  | Steam and Air Traps                              | 5977  | Glass Products for Industry                      | 6026c | Condensing Equipment                       |
| 5812  | Infrared-heated Water Baths         | 5903  | Pre-mixed Grout                   | 5936a | Liquid-level Controls                            | 5978  | Synthetic Filter Cloth                           | 6027  | Pumps                                      |
| 5813a | Dial Thermometers                   | 5904  | Floor Marking Machine             | 5936b | Ice-thickness Controls                           | 5979  | Maleic Anhydride                                 | 6028  | Screw-conveyor Heat Exchangers             |
| 5813b | Recording Thermometers              | 5905  | Protective Coatings               | 5936c | Non-conductive Liquids                           | 5980  | Corrosion-resistant Nickel & Nickel Alloys       | 6029  | Electric Heaters                           |
| 5813c | Industrial Thermometers             | 5906  | Spray Nozzles                     | 5936d | Standard Time Switches                           | 5981a | Plastic Fabrication                              | 6030  | Condenser & Heat Exchanger Tubes           |
| 5813d | Laboratory Thermometers             | 5907  | Steam Generator                   | 5936e | Cycle Repeating                                  | 5981b | Plastic Tank                                     | 6031a | Teflon Sheet, Rod, Tube                    |
| 5814  | Colorimeter-spectrophotometer       | 5908  | Load-sensitive Governor           | 5936f | Program Clocks                                   | 5982  | Valves   | 6031b | Teflon Spray Coating                       |
| 5815  | Drop Counter                        | 5909  | Packless Diaphragm Valves         | 5937  | Immersion Heater                                 | 5983  | Filters  | 6031c | Teflon Precision Molded & Machine Parts    |
| 5816  | Process Control                     | 5910  | Lubricated Plug Valves            | 5938  | Cellular Glass Insulation                        | 5984  | Stainless Steel                                  | 6032a | Grinding Balls                             |
| 5817a | Evaporators                         | 5911  | High-pressure Meter               | 5939  | Quick-seal Couplings                             | 5985  | Pumps  | 6032b | Mill Linings                               |
| 5817b | Burners                             | 5912  | Spinnerettes for Fibers           | 5940  | Tank Lining                                      | 5986  | Process Equipment Fabrication                    | 6032c | Industrial Ceramics                        |
| 5818  | Water Demineralizer                 | 5913  | Pipe Joint Compound               | 5941  | Steam and Air Traps                              | 5987  | Gas Filter                                       | 6033  | Concrete Floor Patch                       |
| 5819  | Mixers                              | 5914  | Micro-bellows Pump                | 5942  | Liquid-level Controls                            | 5988  | Impervious-graphite Centrifugal Pump             | 6034  | Glass-lined Reactors                       |
| 5820  | Pulverizers                         | 5915  | Precast Concrete Wall Panels      | 5943  | Ice-thickness Controls                           | 5989  | Control Valve                                    | 6035a | Laboratory Mixers                          |
| 5821  | Activated Carbon Adsorption Process | 5916  | Power Transmission Products       | 5944  | Non-conductive Liquids                           | 5990  | Plate-coils                                      | 6035b | Top-entering Mixers, Turbine & Paddle-type |
| 5822  | Air Filter                          | 5917  | Steam-traced Pipe                 | 5945  | Standard Time Switches                           | 5991  | Water Demineralizer                              | 6035c | Top-entering Mixers, Propeller-type        |
| 5823  | Mix-Muller                          | 5918  | Bronze Valves                     | 5946  | Heating Elements                                 | 5992  | Homogenizer-disperser                            | 6035d | Side-entering Mixers                       |
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| 5824b | Conical Dry Blender                 | 5920  | Boiler Baffles                    |       |  | 5994  | Petroleum Resin Emulsion                         | 6035f | Portable Mixers                            |
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|       |                                     | 5923  | Industrial Lubricants             |       |  |       |  |       |  |

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Gloves protect from "hot"

Gloves are needed when working with hot materials. This "hot" blinding tree is handled, a milk condition similar to poison ivy. Scientists determine if it is a dairy product.

Rubber retards even when hot

A synthetic rubber is now in small quantities. Mining and more rubber, known when exposed to shortcoming of operation. temperature flexibility. 0°F. However, inertness should be utilized applications.

Aluminum for

Demand for lumber is more and more. Letting nature take its operation. reduces heat absorption in kiln, saving on

**THAT'S  
INTERESTING**



**Gloves protect scientists  
from "hot" wood**

Gloves are needed to handle a shipment of wood recently arrived at the US Forest Products Laboratory in Madison, Wis. This "hot" wood from the "blinding tree of India". If gloves aren't worn when it is handled, a milky substance in the bark creates a skin condition similar to that received from intimate contact with poison ivy. Scientists at the laboratory are testing the wood to determine its papermaking qualities. (*The Paper Industry*)

**Rubber retains properties  
even when boiled in oil**

A synthetic rubber that can stand being boiled in oil is now in small scale experimental production at Minnesota Mining and Manufacturing Co. The flourine-containing rubber, known as Poly-FBA, retains its stability even when exposed to temp of 400°F for long periods. One shortcoming of the development is its limited low-temperature flexibility. It stiffens and becomes brittle at about 0°F. However, high temperature stability and chemical inertness should qualify the material for numerous specialized applications.

**Aluminum foil aids lumber drying**

Demand for lumber has caused many producers to depend more and more upon kiln-drying, which is faster than letting nature take its course. Aluminum foil helps speed the operation. As a lining for lumber-drying kilns, foil reduces heat absorbed by walls and deflects it back into kiln, saving on fuel costs. (*Kaiser Aluminum News*)

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- ☐ B-103 Top Entering Mixers (propeller types)
- ☐ B-104 Side Entering Mixers

- ☐ B-107 Mixing Data Sheet
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